APPLICATION
OF
The Doctrine of TRIANGLES
In certain *Problems*, concerning the Use of
the Plain *Sea-Chart*, and *Mercator's Chart*.
Being the two most usual kinds of *Sailing*.
With a Table of Artificial *Sines*, *Tangents*,
and the *Complements Arithmetical* of *Sines*
supplying the use of *Secants*.
To *Radius* 10,000000, and to every Degree
and Minute of the Quadrant.

ALSO,

The *Logarithms* of Absolute Numbers, from One
to 1000, with a Table of the Right-Ascension
and Declination of the Sun: and certain
Principal Fixed Stars.

Whereunto is added the farther Use of the forenamed Tables
in Questions of *Navigation*, *Astronomy*, and *Geography*;
As also an Universal *ALMANACK*.

This last Edition newly Revised and Corrected.

By Richard Norwood, *Reader of the Mathematicks*.

LONDON,
Printed for *William Fisher*, at the Postern-Gate neal
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NORWOOD'S *Epitome.*

Being the Application of the Doctrine of Triangles in the two principal kinds of Sailing.

MY intent was here to have annexed a Treatiſe of Navigation, and eſpecially of ſuch Points therein, as have reference to the whole *Doctrine of plain and Spherical Triangles*; But I have here ſhewed the reſolution of all uſeful Problems, touching the two principal kinds of Sailing by right-lined Triangles.

Queſtions of Sailing by the plain or ordinary Sea-Chart.

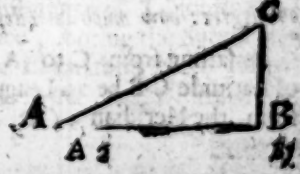
Although the ground of the Projection of the ordinary *Sea-Chart* being falſe (as ſuppoſing the Earth and Sea to be a plain Superficies) and ſo the concluſions thence derived muſt alſo for the moſt part be erroneous, yet becauſe it is moſt eaſie, and much uſed, and the errours in ſmall diſtances not ſo evident, we will not wholly neglect it.

Queſt. 1. *Sailing* 100 *Leagues upon the ſixth Rumb, how much ſhall I alter my Parallel or Latitude?*

Note. The Angle that any Point of the Compaſs makes with the Meridian, we call the Rumb: but the Angle that it makes with any Parallel, we call the complement of the Rumb.

And foraſmuch as to every Point of the compaſs there anſwers 11 *degr.* 15 *min.* therefore the ſixth Rumb from the Meridian (namely, *ENE*, *ESE*, *WSW*, *WNW*) makes an Angle therewith of 67 *degr.* 36 *min.* whoſe complement 22 *degr.* 30 *min.* is the Angle of the ſame Rumb with every Parallel.

Now admit I ſail from C to A Eaſt North Eaſt 100 Leagues, I demand the difference of Latitude B C.



By the third Case of plain Triangles.

As Radius
To the distance run, A C 100 Leagues, 2,00000
So sine complem. the Rumb, s A 22 *deg.* 30 *min.* 9,58284
To the difference of Latitude C B 38 $\frac{2}{10}$ Leagues, 1,58284

In like manner you may find the difference of Latitude for any distance run upon any other Point of the Compass.

2. *Sailing* 100 *Leagues upon the sixth Rumb, How far am I departed from the Meridian of the place from which I came?*

That is, by the same things given as before I demand A B.

By the third Case of plain Triangles.

As Radius
To the distance run, A C 100 Leagues, 2,00000
So is the sine of the Rumb, s C 67 *deg.* 30 *min.* 9,96562
To the departure from the Mer. A B 92 $\frac{4}{10}$ Leagues. 1,96562

3. *Sailing upon the sixth Rumb, till I alter my Latitude one degree, I demand how far I have sailed?*

As sailing from C to A, East Northeast, till the difference of Latitude C B be 20 Leagues, I demand the distance run A C.

Say by the second Case of plain Triangles.

As sine complem. the Rumb, s A 22 *d.* 30 *min. co. ar* 0,41716
To the difference of Latitude C B 20 Leagues, 1,30103
So is Radius
To the distance run A C 52 $\frac{3}{10}$ Leagues 1,71819

The like question might be moved by the departure from the Meridian given.

4. *Sailing upon the sixth Rumb, till I have altered my Latitude one degree: how much am I departed from my first Meridian?*

As sailing from C to A, East Northeast, till the difference of Latitude C B be 20 Leagues, I demand A B, my departure from the Meridian, (as for Example in the former type.)

By

By the First Case of Plain-Triangles.

As Radius
To the difference of Latitude, C B 20 Leagues, 1,30103
So is the Tangent of the Rumb, *t* C 67 *deg.* 30 *min.* 10,38278
To the departure from the Mer. A B 48 $\frac{3}{10}$ Leagues, 1,68381

In like manner by the departure from the Meridian given, you might find the difference of Latitude.

5. *Sailing upon some Rumb between the North and East* 52 $\frac{3}{10}$ *Leagues, and finding that I have altered my Latitude one degree, I demand upon what Point I have sailed?*

As if I sail from C to A, (being some Rumb between the East and North) 52 $\frac{3}{10}$ Leagues; and then find the difference of Latitude C B to be 20 Leagues; I demand the Angle A C B.

Say by the sixth Case.

As the distance run, C A 52 $\frac{3}{10}$ Leagues, *co. ar.* 8,28191
Is to Radius:
So is the difference of Latitude C B 20 Leagues, 1,30103
To sine compl. the Rumb, *s* A 22 *deg.* 30 *min.* 9,58294

Whose complement C, 67 *deg.* 30 *min.* is the sixth Point from the Meridian, namely, East Northeast. Here we neglect some part of a minute (as in these things not to be regarded) and so in other places.

6. *Sailing upon some Rumb between the North and the East,* 52 $\frac{3}{10}$ *Leagues, and finding that I have altered my Latitude one degree: I would know my departure from my first Meridian.*

By the seventh Case:

To the distance run, add the difference of Latitude, and also substract it from the said distance, noting the Summ and Remainder. Then add together the Logarithms of this Summ and Remainder, and half that total is the Logarithm of the distance from the first Meridian.

[illegible] run C A, 52 $\frac{3}{13}$ leag.	Sum 72 $\frac{3}{10}$ leag.	1,85884
[illegible] of Lat. C B, 20 leag.	Remain 32 $\frac{3}{10}$ leag,	1,50853
		3,36737
Departure from the Meridian A B, 48 $\frac{3}{10}$ leagues		1,68368

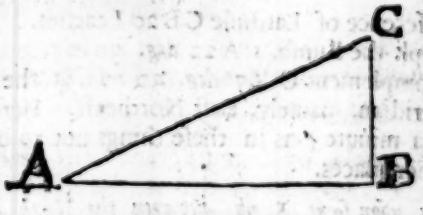
The same may be otherwise found by the same case.

And in like sort might the difference of Latitude be found, the Departure from the Meridian being known.

7. *The distance of the Meridians of two places, and the difference of the Latitudes of the same places being given, to find the Rumb and distance.*

As let A represent the *Lizard* in the West part of *England*, and A B the Parallel thereof, and let C represent St. *Maries* Island being one of the Azores, C B the Meridian thereof.

Then is A B the distance of the *Lizard* from the Meridian of St. *Maries*, which let be 222 Leagues; and A B the distance of their Parallels, or difference of their Latitudes 256 leagues; I demand the Rumb, namely, the Angle at C, and the distance in the Rumb A C.



First, for the Rumb, say by the fourth Case.

As the difference of Latit. C B 256 leagues, *co ar.*	7.59176
Is in proportion to Radius;	
So is the distance of the Meridian A B 272 leagues,	2,43457
To the tangent of the Rumb *t* C 46 *deg.* 44 *min.*	10,02633

which is the fourth Rumb from the Meridian, and 1 *degr.* 44 *m.* more; which shews the Course from St. *Maries* to the *Lizard* to be Northeast, 1 *degr.* 44 *min.* Easterly: or from the *Lizard* to St. *Maries* Southwest, 1 *degr.* 44 *min.* Westerly. And thus it should be by the plain *Chart.*

Secondly,

Secondly, for the distance A C, *say by the Secon*

As the sine of the Rumb *s* C 46 *degr.* 44 *m.* *co.*

To the distance of the Meridians A B, 272 leag.

So is the Radius

To the distance of the places A C, 373 $\frac{1}{2}$ leagues. 2,57033

And such should be the distance by the *plain-Chart.*

8. *Sailing away* W S W, *I see a Point of Land, which I set, and find to bear from me* West *by* North, *and having sailed* 6 *Leagues further, I find it bears from me* Northeast *by* West: *I would know how far it is distant?*

As let E be a Point of Land, which when the Ship is at A, I set, and find to bear from *West* by *North*; but I hold on my course from A to D, West Southwest 18 miles, and at D I set the same Point of Land again, and find it to bear from me Northwest by West: I demand the distance thereof D E, that is, how far it was from me in my last observation?

First I consider between A E, the *West* by *North*, and A D the *West Southwest*, is three Points of the Compass, that is, 33 *deg.* 45 *min.* which is the Angle at A: also between E A, the *East* by *South*, and E D the *Southeast* by *E.* are two Points, that is 22 *deg.* 30 *min.*

Therefore by the 8 *Case of plain* Triangles.

As sine the Angle at the point seen,	*s* E 22 *d.* 30 *m. co. ar.*	0,41716
Is to the distance run,	A D 18 miles,	1,25527
So sine the Angle at the first place of observation,	*s* A 33 *degr.* 45 *min.*	9,74474
To the distance of the point seen,	E D 26 $\frac{1}{10}$ miles,	1,41717

Whereby it appears that the distance of the Point seen from the place of your last observation is 26 miles, and a furlong. In like manner you may find the distance thereof from the place of your first observation A.

9. *Admit the Course from the* Lizard *to* S. Maries *be* S. W *the distance* 372 $\frac{1}{2}$ *leagues.*

A certain Ship bound from the *Lizard* to *S. Maries* steers away *S S W*, and afterwards *W* by *S*, and so sometimes upon one of those points, sometimes upon the other, till he arrives at *S. Maries*; Now I demand how many Leagues she hath sailed upon one of these Points, and how many upon the other?

Let A be *Lizard*, E St. *Maries*, and seeing S S W, being from Southwest two Points makes an Angle therewith of 22 *deg.* 30 *min.* which let be A; also West by South makes with S W an Angle of 33 *deg.* 45 *min.* which let be E, also South S W, makes with West by South an Angle of 56 *deg.* 15 *min.* which let be the complement of D to 180 *degrees.*

Therefore by the 8th Case.

As the sine of	D, 56 *deg.* 15 *min. co. ar.*	0,08015
To the distance given	A E, 373 $\frac{1}{2}$ Leagues,	2,57113
So is the sine of	E, 33 *deg.* 45 *min.*	7,74474
To	A D, 248 $\frac{9}{10}$ Leagues,	2,39602

which is the distance run upon the West by South points.

Again

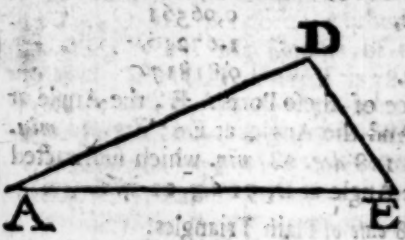
As the sine of	D, 56 *deg.* 15 *min. co. ar*	0,08015
To the distance given	A E, 372 $\frac{1}{2}$ Leagues,	2,57113
So is the sine of	A 22 *deg.* 30 *min.*	0,58294
To the way run,	E D 171 $\frac{44}{100}$ Leagues,	2,2512

Which is the distance run upon the West by South points.

10. *A Merchant-man, being in the Latitude of* 43 *degrees, falls into the hands of Pirates, who amongst other things, take away his* Sea-compass. *But when he is gotten clear, he sails away as directly as he can, and after two dayes meets with a man of War, who also had been the day before in the Latitude of* 43 deg. *and had sailed thence* S E *by* South 37 *Leagues. He desirous to find those Pirates, the Merchant-man tells them he left them lying to and fro where they took him, and he had sailed since at least* 64 *Leagues, between the* South *and* West; *what Course shall the Man of War shape to find these Pirates?*

Let

Let A E be the Parallel of 43 *degrees*, D the place where the Ships meet: then is there given A D 64 Leagues, E D 37 Leagues, and the Angle D E A 5 points or 56 *deg.* 15 *min.*



Therefore by the 9th Case of plain Triangles.

As the distance run by the Merchant man,	A D, 64 Leagues, *co. ar.*		8,19382
To fine the Angle given,	*s* E, 56 *deg.* 15 *min.*		9,91985
So is the distance run by the Man of War,	E D, 37 Leagues,		1,56820
To fine an Angle required,	*s* A, 28 *deg.* 44 *min.*		9,68187

That is West Southwest, 6 *deg.* 14 *min.* Southerly, and so hath the Merchant sailed; therefore to return to the same place, he must shape his Course East Northeast 6 *deg.* 41 *min.* Northerly.

11. *There are* 2 *Ports lying* NE, *and* NW, *one off another, a Ship sails from the Westermost of these Ports* East Southeast 47 *Leagues; another departing from the Eastermost Port sails* 66 *Leagues, and then meets with the former: what Course hath this second Ship kept, and how far are these Ports asunder?*

Let the Northeast Port be A, the Southeast E, and the place where these ships meet at D. And forasmuch as from E to A, the Course is Northeast, and from E to D East Southeast, therefore the Angle at E, is 67 *deg.* 30 *min.* and the side E D, 47 Leagues, and A D 66 Leagues.

Therefore by the 9th Case of plain Triangles.

And seeing from A to E, the Course is Southwest, and from A to D 41 *deg.* 08 *min.* more Southerly: therefore the Course from A to D, is South 3 *deg.* 52 *min.* Westerly.

As

As A D 66 Leag. *co. ar.* 8,18046
To ſine E, 67 *degr.* 30 *min.* 9,96561
So E D 47 Leagues. 1,67210
To ſine A. 41 *deg.* 08 *min.* 9,81817

Secondly for the diſtance of theſe Ports A E, the Angle at A, being 41 *deg.* 08 *min.* And the Angle at E 67 *deg.* 30 *min.* the ſumm of them both is 108 *deg.* 38 *min.* which ſubſtracted from 180 *degrees*, leaves the Angle at D, 71 *deg.* 22 *min.*

Therefore the 8 caſe of Plain Triangles.

As ſine E. 67 *d.* 30 *m. co ar.* 0,03439
To A D 66 Leagues, 1,81954
So ſine D 71 *deg.* 22 *min.* 9,97662
To A E 67 $\frac{7}{10}$ Leagues. 1,83055

So that the diſtance between the two Ports is 67 $\frac{7}{10}$ leagues.

Some may think it requiſite, that the latter part of this Problem ſhould have been a diſtinct Caſe in plain Triangles; but becauſe the ſame things are here given as in the 9 Caſe, and the operation manifeſt by the 8 and 9, I thought it not neceſſary to make another Caſe of it.

12. *Coaſting along towards the Evening, I have ſight of a Cape or head-land, beyond which I deſire to ſteer in, the next morning it bears from me* S S E, *and is diſtant by eſtimation* 11 *Leagues, but I ſteer away* South *till two of the clock in the morning about* 12 *Leagues, and then would know how the Cape bears from me, and how far it is off.*

As Admit A, I obſerve the Cape D to bear from the South Southeaſt 11 Leagues; but I ſteer away South, to E 12 Leagues. I have then A D 11 Leagues, A E 12 Leagues, the Angle at A 22 *deg.* 30 *min.* (as for example,) in the forgoing Type.

Firſt, then for the angle at E by the 10 *Caſe.*

As A E ——— A D 23 Leagues *com. ar.* 8,63828
To A E ——— A D, 01 League,
So $t\frac{1}{2}$ (E x D) *t* 78 *degrees* 45 *minutes*, 10.70134
To tang. an angle F, 12 *degrees* 20 *minutes*, 9,33962
Which ſubſtracted there remains } E 66 *deg.* 25 *min.*

In

In working this Example: because the Angle given A, is 22 *degr.* 30 *min.* therefore the other two E and D, the 157 *deg.* 30 *min.* (by the first Lemma of the third Chapter of plain Triangles) the half whereof is 78 *degr.* 45 *min.* Whereby we find an Angle F, 12 *degr.* 20 *min.* which substracted from 78 *degr.* 45 *min.* there remains the Angle at E, 66 *degr.* 25 *min.* Wherefore seeing E A is a North-line, E D is almost East Northeast, namely, East Northeast 1 *degree* 5 *minutes* Northerly.

Secondly, for the distance of the Cape E D *by the* 8 *Case.*

As sine the Angle found, *t* E 66 *d.* 25 *m. co. ar.*	0,03788
To the distance in the evening, A D 11 Leagues,	1,04139
So the sine of the angle given, *s* A 22 *d.* 30 *min.*	0,58284
To the distance in the morning, E D 4 $\frac{6}{10}$ Leagues,	0,66211

That is above 4 Leagues and a half distant.

13. *Admit I sail away from a certain Port* S S W 50 Leagues, *and thence again* W by S 30 *leagues, upon what Point have I made my way good, and how far am I come from a Port?*

As admit I sail from A to D South Southwest 50 Leagues, and from D to E, West by South 30 Leagues, there is required the Course A, or E, and A E.

From the South Southwest to the West by South are 5 Points, that is 56 *degr.* 15 *min.* which is the Complement of the Angle at D, to 180 *degr.* so that the Angle at D is 123 *degr.* 45 *min.* Wherefore here are given the two sides A D, and E D, and their contained Angle at D; therefore——

As A D x E D, 80 Leagues,	*co ar.*	8,09691
To A D—— E D 20 Leagues,		1,30103
So *t* $\frac{1}{2}$ (A x E) *t* 28 *degrees* 08 *minutes.*		9,72810
To *t* F, 07 *degrees* 37 *minutes*,		9,12004

Which substracted there remains } A 20 *degrees* 31 *minutes.*

Wherefore seeing the Course from A D, is South Southwest, the Course from A to E, is 20 *degrees* 31 *minutes* more Westerly, that is Southwest, 2 *degrees* Southerly; so that I have made my way good Southwest 2 *degrees* Southerly.

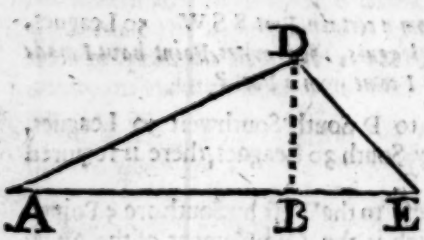
Secondly

Secondly, for the distance upon that Point.

As sine the Angle found, 5 A 20 *deg.* 13 *min. co. ar.* 0,45534
To his opposite side given, E D, 30 Leagues, 1,47712
So sine the Angle given, 5 D 56 *degrees* 15 *minute,s* 9,91985
To his opposite side required, A E, 71 $\frac{2}{10}$ Leagues, 1,85231
Which is the distance from that Port.

14. *there are two Ports in one and the same Parallel or Latitude distant* 64 *leagues, and there is a certain Island more Southerly, distant from the Eastermost of these Ports* 47 *leagues, and from the Westermost of them* 37 *leagues: I demand the Course from the Eastermost Port to that Island?*

Let the Eastermost Port be A, the Westermost E, both in one and the same parallel A E, distant 64 Leagues; and let the Island be D, distant from A, 47 leag. and from E 34 leagues; there is required the course from A to D, that is, the angle at A, or the complement thereof.



By the 12 *Case of* plain Triangles.

As the distance of the parts A E, 64 Leagues, *co. ar.* 8,19382
To the summ of A D, and E D, 81 Leagues, 1,90848
So is the difference of A D, and E D, 13 Leagues, 1,11394
To a certain line, A, 16 $\frac{454}{1000}$ 1,21624
Which added to A E, is 80 $\frac{454}{1000}$
The half whereof is A B, 40 $\frac{227}{1000}$

Then

Then by the 6 Caſe of plain Triangles.

As A D 47 Leagues, *compl. Arith.* 8,32790
To Radius;
So A B, 40 227 1,60452
1000
To *s c* A, *s* 58 *degrees* 51 *minutes.* 9,93242

That is Southweſt and by Weſt, 2 *deg.* 36 *min.* Weſterly, which is the Courſe from the Eaſtermoſt Port to the Iſland.

15. *A Ship ſails from one Port to a ſecond S S E 76 leagues, and from thence to a third 54 leagues, and from that third to the firſt 85 leagues: I demand the Courſe from the ſecond Port to the third and from the third to the firſt.*

This and the like are to be wrought as the former, which therefore we leave to your own practice.

Of Sailing by Mercators *Chart.*

AND thus much of the plain *Chart*, which as it hath this commodity, that it is moſt eaſie; ſo it hath ſome diſcommodities intollerable. For there be very few places that can therein be expreſſed, according to the true ſituation and diſtance one from another, which as it is a great impediment in the practice of Navigation, ſo it hath cauſed much confuſion in the *Geographical* and *Hydrographical* deſcriptions of places; inſomuch as there are ſcarce extant any Deſcriptions of the World, or the Parts thereof, that are not peſtered with notorious Errours: the greateſt part of them hence ariſing. It is indeed antient, and till the Sea-Compaſs was known, it was the apteſt *Chart* that could be uſed, becauſe till then, men were Coaſters, and for the moſt part returned back the ſame way they went forth; and it may ſtill ſerve without any great Errour in ſuch places as are near the Equinoctial; alſo in many other places for ſhort Voyages, and even for long Voyages, provided that a man be ſure to return the ſame way that he went, or near the ſame; Otherwiſe, if he truſt to the plain *Chart*, he will be moſt groſly deceived many times in his Courſe a Point or two of his Compaſs,

paſs, and in his diſtance many hundred miſes. But in this *Sea-Chart* called *Mercator's*, all or any parts of the World may be ſet down, according to their Longitudes, Latitudes, Courſes, and Diſtances, as truly and far more conveniently for the Mariners uſe, than upon the Globe it ſelf: ſo that it will truly ſhew the direction and diſtance from place to place, which way ſoever a man goes or returns.

Some men will ſay, that in divers reckonings by *Mercator's Chart*, they have found as little certainty, as by the plain *Chart*, which I deny not; but the Reaſon is, becauſe there are few or no *Charts* made directly according to this Projection. It will be ſaid, Yes, there be many; and that a Man may have of them whenſoever he will beſpeak them. I grant a man may have thoſe which are ſo called, but that which is ſuch indeed, muſt not only have the Meridians, Parallels, and Rumbs drawn according to this Projection; but the Sea-Coaſts muſt be inſerted by the like Art and means as they have formerly been inſerted into the common *Sea-Chart*: otherwiſe, he that ſhall transfer places out of the common *Sea-Chart* into *Mercator's*, without due knowledge and reſpect upon what occaſion, or for what reaſon they were ſo placed in the common *Sea Chart*; he ſhall transfer the Errours of the one into the other. And that ſometimes with increaſe; wherefore it requires more than an ordinary judgment, to draw a plot directly according to this Projection for any place or places, and he muſt further know, or be made acquainted with the reckonings of Mariners frequenting thoſe places; and that truly whether with allowance or without, and whether agreeing or diſagreeing with their Plots, and ſo comparing one thing with another, and weighing all in the ballance of a good judgment, he ſhall be able to do it. The ground of the Projection of this kind of *Charts* was pointed at by *Ptolemy* many hundred years ſince; and according to that ground, *Mercator* did of late years ſet forth an univerſal Map of the World: whereupon theſe have been called *Mercator's Charts*. But the way how to deſcribe them was firſt taught by that learned Navigator of our times. Mr. *Edward Wright*, in his Book of the *Correction of Errours in Navigation*.

from

From whence also the Grounds and reasons of these ensuing Problems are to be taken: and if we would be as gratefull to our own Country-men as to strangers, I see not but we may ascribe as much to him in this, as to any other man. Now that which he hath shewed to perform by the *Chart* it self, we will here shew to work by the Doctrine of plain Triangles, using the help of the Table of *Lagarithm Tangents*, beginning at 45 *d.* 00 *min.* and so increasing upwards, accounting every 30 *m.* to be one *d.* of the Merid. Line, as the Tangent of 45 *d.* 30 *min.* to be one *degree* of the Meridian Line, the Tangent of 46 *deg.* 0 *min.* to be 2 *deg.* 0 *min.* of the Merid. Line, and so forwards, so that every *min.* is two *min.* of the Meridian Line; and although that these be not the same Meridional parts that are in the Doctrine of Triangles, yet they proceed in the same proportion as the *Secants* added together do, and shall produce the same solution to every Problem of Sailing by *Mercator's Chart*, as the other Tables do; but because in this small volume we have but one *Chiliad* of 1000 *Lagarithms*, I shall work by Leagues, and not by Miles or Minutes; yet I shall resolve the same Problems of sailing by *Mercator's Chart*, that are set down in the Doctrine of Triangles,

Probl. I. *To find by these Tables what Meridional Leagues are contained in any difference of Latitude.*

TO perform this Problem, we must take half of each of the given Latitudes, and to each half add 45 *deg*, 0 *m.* and the sum shall shew us the *d.* and *m.* where we shall find the Tangent to give us the Merid. Leagues from the Equinoctial to each Lat. But it shall suffice us to substract the lesser Tang. out of the greater, and to multiply the difference or remainder by 10, and so divide that Product by 376, and the Quotient shall be the Meridional leagues contained between the two Latitudes.

As let one Latitude be 50 *deg.* 00 *min.* the other 32 *deg.* 35 *min.* The half of 50 *deg.* 00 *min.* is 25 *deg.* 00 *min.* to which add 45 *deg.* 00 *min.* the sum is 70 *deg.* 00 *min.* which are 43893.

The half of 32 *deg.* 35 *min.* is 16 *deg.* 17 *min.* and an half, to which add 45 *deg.* 00 *min.* the sum is 61 *deg.* 17 *min* $\frac{2}{12}$

where

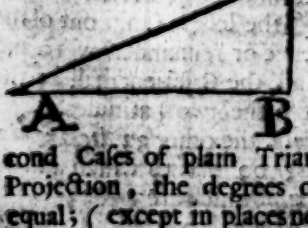
where we muſt look the equal parts, *viz.* at the Tangent of 61 *deg.* 17 *min.* and a half, which are 26147, which ſubſtracted from 43893, and the remainder is 17746, which multiplied by 10, is 177460, and that divided by 376, the Quotient is 472 Leagues neareſt, Which are the meridional Leagues contained between the two Latitudes; and the like is to be done for all Latitudes whatſoever.

Now although this way doth a little differ from that way done by meridional parts; yet the difference is of no validity to breed any conſiderable Errour in the Courſe, and ſo by conſequence not in the diſtance; and therefore I deſire a favourable conſtruction of it.

Probl. II. *The Latitudes, and difference of Longitude of two places given; to find the Rumb and diſtance.*

TO the intent the application may be the more evident, we will give Examples of two places expreſſed in the *Chart*. As admit the Latitude of the *Lizard* to be 50 *deg.* 00 *min.* the latitude of Summer Iſlands, ſometimes called the *Bermudas* 32 *d.* 25 *m.* and the difference of Longitude to be 70 *d.* 00 *m.* the Summer-Iſlands being ſo much to the Weſtward of the *Lizard*. I demand the Courſe, and the diſtance from the one to the other.

As in this right-angled Triangle A D B, Let A repreſent the *Lizard*, and A B the Parallel thereof, D Summer-Iſlands, and D B the Meridian thereof.



Then is there given D B the difference of Latitude 17 *deg.* 35 *min.* and A B the difference of Longitude 70 *degr.* 00 *min.* whereby the Angle and Hypothenuſal ſhould be found by the fourth and ſecond Caſes of plain Triangles. But becauſe in this kind of Projection, the degrees of Longitude and Latitude are not equal; (except in places near the Equinoctial) the degrees of Latitude at every Parallel exceeding the degrees of Longitude in ſuch proportion as the Equinoctial exceeds that Parallel thereof

therefore these differences of Longitude and Latitude must first be expressed by some one common measure. And for that purpose serves the Table of Tangents which sheweth how many equal Leagues are from the Equinoctial to every *degree* of Latitude: namely, of such equal Leagues as a degree of Longitude doth contain 20.

Wherefore multiplying 70 *d.* 00 *min.* the difference of Lon. by 20. I have 140 for the Meridional Leagues contained in the difference of Longitude; also (by the last Problem) I find the Meridional Leagues contained in the difference of Latitude to be 472, so that D E is 472 Leag. and A B 1400 such Leagues.

Therefore by the fourth Case of plain Triangles.

As the differ. of latit. in Leag. D E 472 *co. ar.*	732606
Is in proportion to Radius,	
So is the difference of Longit. in leagues A B 1400	314612
To the Tangent of the Rumb, *t* D 71 *deg.* 21 *min.*	10,47218

Which sheweth the Course from the Summer-Islands to the *Lizard* to be East Northeast 3 *d.* 52 *m.* Easterly, or from the *Lizard* to the Summer-Islands, W S W, 3 *d.* 52 *m.* Westerly.

Secondly, for the distance in the Rumb,

Reduce the difference of Latitude into Leagues (multiplying the *deg.* by 20) and to the product adding 1 third of the *min.*

Then by the second Case of plain Triangles.

As sine Compl. the Rumb *s* A, 18 *d.* 39 *min. co. ar.*	049514
To the difference of Latitude D B, 352 Leagues;	254654
So is Radius	
To the distance A D, 1100 Leagues,	304168

And this is the distance measured in the Rumb; there is a nearer cut between those two places, whereof we shall speak hereafter in *Great Circle sailing*, which is by Segments of several Rumbs often changing the course, but here whensoever we speak of the distance of two places, we mean their distance measured in one Rumb.

Probl. 3. *The Latitude of two places, and their distance given: to find the Rumb and difference of Longitude.*

ADmit I sail from the *Lizard*, being in the Latitude of 50 *d.* upon some point to the Westward 1100 Leagues and then find

find my self in the Latitude of 32 *deg.* 25 *m.* I would know upon what point I have made my way good; and how much I have altered my Longitude?

The difference of Latitude D B. is 17 *d.* 35 *m.* which reduced into Leagues, is 352 Leag. (As in the forgoing type.)

As the distance sailed A D, 11 00 Leag. *co. ar.*	6,95832
Is in proportion to Radius:	
So is the difference of Latitude D B, 352 leagues.	254654
To sine complement the Rumb *s* A, 18 *d.* 39. *m.*	9,50486

That is West Southwest 3 *d.* 51 *m.* Westerly.

Secondly, for the difference of Longitude.

Find by the first Probl. what Meridional leag. are contained in the difference of Latit. which are here 472, then say,

As Radius	
To the defference of Latitude in leagues D E, 472	267394
So is the Tangent of the Rumb *t* D, 71 *d.* 21 *min.*	47218
To the difference of Longit. in leagues, A B 1400	314612

Which leagues reduced into Degrees, dividing them by 20, the Quotient is 70 *d.* the difference of Longitude required.

Probl. 4 *By the Rumb, and Latitudes of two places given, to find their distance, and difference of Longitude.*

ADmit I sail from the *Lizard*, being in the Latitude of 50 *d.* West Southwest 3 *d.* 51 *min.* westerly, till I find my self in the latit. of 32 *d.* 25 *m.* I demand how far I have sailed, and how much I have altered my Longitude?

The distance is found as in the latter part of the 2 Prob. thus.

The difference of latit converted into leagues is 352. Say then.

As sine complem. the Rumb *s* A, 18 *d.* 39 *m.*	0,49514
To the difference of Latitude D B, 352 leagues,	254654
So is Radius:	
To the distance A D, 1100 leagues,	304168

And so much is the distance; the difference of Longitude may be found as in the latter part of the 3 Problem, saying,

As Radius, to the difference of Latit. in Meridional leagues, so is the Tang. of the Rumb, to the difference of Longitude in leagues.

Probl. 5.

Probl. 5. *By the difference of Longitude, Rumb, and one latitude: to find the other latitude, and the distance?*

Admit I sail from the *Lizard*, being in the latit. of 50 *d.* west Southw. 3 *d.* westerly, till I have altered my long. 70 *d.* how much have I laid the Pole, and how far am I from the *Lizard?*

Reduce the difference of longit. into leagues by 20, and so makes 1400; then say,

As the Tang. of the Rumb to D, 71 *d.* 21 *m.* *co.ar.*	952829
So the difference of longit. in leagues A B, 1400.	314612
So is Radius	
To the difference of Latitude in leagues D B, 472,	2,67441

Which 472 leagues multiplied by 376, and the Product 77472, and that divide by 10, and the quotient is 17747. which I substract from the equal parts of latit. of 50 *d.* 0 *m.* which we found by the Problem, to be at the tang. of 70 *d.* 0 *m.* viz. 43893, and the remainder is 26146, whic I seek in the tangents; and find it in the tangent of 61 *d.* 17 *m.* and a half, from which I substract 45 *d.* 0 *m.* and the remainder is 16 *d.* 17 *m.* and an half, which being doubled, is 32 *d.* 35 *m.* the latitude of the place to which I am come.

Secondly for the distance.

Having already the Rumb, and the difference of latitude, it may be found as in the second and fourth Problem; saying,

As sine compl. the Rumb, to A 18 *d.* 39 *m.* *co. ar.*	0,49514
So the difference of latitude, D B 352 leagues,	251654
So is Radius,	
To the distance, A D 1100 leagues,	3,04168

Probl. 6. *By the Rumb, the distance and one latitude given, to find the other latitude, and the difference of longitude?*

Admit I sail West Southwest 3 *d.* 51 *m.* westerly, 1100 leag. and then find my self in the latitude of 32 *d.* 25 *m.* I demand the latitude of the place from which I came, and the difference of longitude between that and this?

First, for the difference of Latitude.

As Radius
To the distance run A D 1100 Leagues, 304168
So sine complem. the Rumb s A, 18 *deg.* 39 *min.* 956486
To the difference of Latitude, D B 352 Leagues, 254654

Which 352 Leagues converted into *deg.* is 17 *d.* 35 *m.* th difference of Latitude required; which added to 32 *d.* 25 *m* makes 50 *d.* 00 *m.* the Latitude of the first place.

The difference of Longitude is found, as before in the third Problem; saying,

As Radius to the difference in Latitude in Meridional Leag so is the Tangent of the Rumb, to the difference of Longitud in Leagues.

And thus the difference of Longitude will be found, as i this Example, to be 70 *d.* 00 *m.*

If at any time you desire to convert this difference of Lon gitude found in any Parallel into Leagues, you may do it afte this Example.

7. *Admit there be two places both in the Parallel of* 50 deg. *whic differ in Longitude* 70 deg. 00 min. *I demand the distance t these two places?*

First, it is to be understood that the Leagues of Longitud in any Parallel, are in proportion to the distance in Leag. a the Equinoctal is to that parallel, or as the Semidiameter o the one, is to the Semidiameter of the other.

That is,

As Radius is in proportion
To sine compl. the Latit. *s. c.* 50 *d.* 00 *m.* 980806
So is difference of Longit. 1400 Leag. 314611
To the distance in that Parallel, 900 Leag. 295417

A Table for the Angles which every Rumb or Point of the Compass maketh with the Meridian.

North	South	D.	M.	South	North	Point.
		02	49			
		05	38			
		08	26			
N *by* E	S *by* E	11	15	S *by* W	N *by* W	1
		14	04			
		16	53			
		19	41			
N N E	S S E	22	30	S S W	N N W	2
		25	19			
		28	08			
		30	36			
NE *by* N	SE *by* S	33	45	SW *by* S	NW *by* N	3
		36	34			
		39	23			
		42	11			
NE	SE	45	00	SW	NW	4
		47	49			
		50	37			
		53	26			
NE *by* E	SE *by* E	56	15	SW *by* W	NW *by* W	5
		59	04			
		61	52			
		64	41			
E N E	E S E	67	30	W S W	W N W	6
		70	19			
		73	07			
		75	56			
E *by* N	E *by* S	78	45	W *by* S	W *by* N	7
		81	34			
		84	22			
		87	11			
East.	East.	90	00	West.	West.	8

Propositions in ASTRONOMY and NAVIGATION, performed by the Tables of Artificial *Sines*, *Tangents*, and *Logarithms*.

Prop. 1. *The Suns place being known, to find his Declination.*

AS the Radius to the sine of Suns greatest declination 23 *d.* 30 *m.* so is the sine of the Suns distance from the next Equinoctial point, to the sine of his present declination.

So the Sun being in 20 *d.* 36 *m.* of *Taurus*, his declination will be found to be 17 *d.* 58 *m.* almost.

Prop. 2. *The Suns declination being given, to find his place in the* Zodiack.

AS the sine of Suns greatest declination is to the Radius, so is the present declination to the present place.

So the Sun having 17 *d.* 58 *m.* of North declination, his place will be found to be in 20 *d.* 36 *m.* of *Taurus*, or 9 *d.* 24 *m.* of the parallel sign *Leo*.

Prop. 3. *The latitude of the place, and declination of the Sun given, to find his Amplitude.*

AS the Co-sine of the Latitude is to the Radius, so is the sine of the declination, to the sine of the Amplitude.

So the Sun having 11 *d.* 48 *m.* of North declination, his amplitude will be found to be 19 *d.* 15 *m.* North also: For this is general, that if the Sun be in Northern Signs, as in *Aries*, *Taurus*, *Gemini*, *Cancer*, *Leo*, *Virgo*, he hath North declination and North Amplitude. And if in Southern Signs, as in *Libra*, *Scorpio*, *Sagittar.* *Capric.* *Pisces*, or *Aquarius*, South declination and South amplitude.

Prop. 4. *The Suns declination and Amplitude given, to find the height of the Pole.*

AS the sine of of the Amplitude to the of the declination so Radius to the Co-sine of the Latitude.

So the declination being 11 *d.* 41 *m.* and the amplitude 19 *d.* 7 *m.* the height of the Equinoctial will be found to be 38 *d.* 19 *m.* whose compliment 51 *d.* 41 *m.* is the height of the Pole.

Prop. 5

Probl. 5. *The Latitude of the place, and declination of the Sun given, to find his right Aſcenſion.*

AS Radius to the Tangent of the Suns diſtance from the next Equinoctial point, ſo is the Co-ſine of the greateſt declination to the Tangent of the Right Aſcenſion.

So the Sun being in 20 *d* of *Taurus*, (that is 50 *d.* from the next Equinoctial point *Aries*) his right Aſcenſion will be found to be 47 *d.* 32 *m.*

Prop. 6. *The Latitude of the place, and declination of the Sun given, to find the Aſcenſional difference, which is the time of the Suns riſing or ſetting.*

AS the Co-tangent of the Latit. to the Tangent of the declination; ſo is Radius to the ſine of the aſcenſional difference. So the Latitude being 51 *d.* 30 *m.* North, and the declination 20 *d.* the difference of Aſcenſion will be found to be 27 *d.* 14 *m.* which reduced into time (by allowing 15 *d.* for one hour, and 4 *m.* of time for 1 *d.*) doth give 1 hour, and almoſt 46 *m.* for the difference between the Suns riſing or ſetting, before or after the hour of ſix according to the time of the year, that is, when the Sun is in Northern ſigns, the Sun riſes before, and ſets after ſix, and in Southern ſigns he riſes after, and ſets before ſix.

Prop. 7. *The Amplitude, and difference of Aſcenſion of the Sun, or Star given, to find his declination.*

AS the ſine of the Aſcenſional difference is to the Co-ſine of the Amplitude, ſo is the Radius to the Co-ſine of the declination.

So the Aſcenſional difference being 27 *d.* 34. ſhews the Sun riſes at 4 a clock and 10 *min* which converted into *degr.* makes 62 *d.* 30 *min.* and the Amplitude 33 *d.* 38 *min.*

The declination will be found 20 *d.* 10 *m.*

Prop. 8: *The Latitude and declination given, to find the Meridian Altitude.*

IF the Sun hath North Declination, add the complement of the Latitude to the declination, the ſum is the Merid. Altitude: But if the Sun hath South declination, ſubſtract the declination from the complement of the Latit. the reſidue is the Meridian Altitude.

So the Latit. being 51 *d.* 40 *m.* the complement thereof is 38 *d.* 20 *m.* and let the declination be 23 *d.* 30 *m.* North. Add 38 *d.* 20 *m.* to 23 *d.* 30 *m.* the ſum is 16 *d.* 50 *m.* the Meridian altitude. But if the declination had been 23 *d.* 30 *m.* South, ſubſtract 23 *deg.* 30 *min.* from 38 *d.* 20 *min.* the remain would be 14 *d.* 50 *m.* for the Merid. Altitude.

Prop. 9: *The Latitude and Declination known, to find the height of the Sun at any hour.*

AS the Co-ſine of the hour from the Meridian is to Radius ſo the Tang. of the Latit. to the Tang. of a fourth Ark.

So in the Latit. 51 *d.* 30 *m.* and one hour from the Meridian, (which is either 11 or 1 a clock) this fourth Ark will be found to be 52 *d.* 28 *m.*

Then conſider the declination of the Sun, and the hour propoſed, if the Latit. and declination be alike, both North as with us, and the hour propoſed be between noon and ſix, take the declination out of the fourth Ark; the remainder ſhall be a fifth Ark. But if the hour fall between ſix and midnight, or the Latit. and declination be unlike (one North, the other South) add the declination to the fourth Ark, and the ſum ſhall be a fifth Ark, if the ſum exceed 90 *d.* take it from 180 *d.* the remain is the fifth Ark. The fifth Ark being found,

Say,

As the ſine of the fourth Ark to the Sine of the Latit. ſo the Co-ſine of the fifth Ark, to the ſine of the Altitude.

So the Latitude being 51 *d.* 30 *m.* North, the Declination 23 *d.* 30 *m.* North; if it be required to find the Suns Altitude at 7 in the Morning, you ſhall find it to be 27 *d.* 17 *m.*

Prop. 10:

Prop. 10. *The Latitude of the place, the declination of the Sun and the altitude of the Sun given, to find his Azimuth.*

CONsider whether the Suns declination be North or South, ſo have you his diſtance from the Pole. Add the Suns diſtance from the Pole, the complement of your Latitude, and the complement of your Altitude all three into one ſumm, and from half that ſumm ſubſtract the diſtance of the Sun from the Pole, and note the difference;

Then ſay,

1. As Radius to the Co ſine of the Altitude, ſo the Co-ſine of the Latitude to a fourth ſine.

2. As this fourth ſine is to the ſine of the half ſumm; ſo is the ſine of the difference to a ſeventh ſine, unto which ſeventh ſine, if you add the ſine of 90 *deg.* half that ſumm will be the ſine of an Ark, whoſe complement being doubled, is the Azimuth from the North part of the Meridian.

So if the Latitude be 51 *d.* 30 *m.* North, the Declination 8 *d.* South, and the Altitude 12 *degr.* the Azimuth from the North part of the Meridian will be found to be 140 *degr.*

Prop. 11. *The Latitude given, to find how many minutes, or miles of the Equinoctial, make a* d. *of long. in any Parallel*

AS the ſine of 90 *d.* is to the number of 60 miles, ſo the Co-ſine of the Lat. to the miles anſwerable to a *d.* in the Lat. deſired.

So in the Latitude of 51 *d.* 40 *m.* 37 miles will anſwer to one *degr.* in the Longitude.

Prop. 12. *The Courſe and diſtance given, to find the difference of Latitude.*

AS the ſine of 90 *deg.* to the Logarithm of the miles run; ſo the ſine of the Courſes diſtance from Eaſt or Weſt, to the difference of Latitude.

So if the Courſe be W S W (which is 22 *d.* 30 *m.* from the Weſt) the miles 225, the difference of Latitude will be found to be 1 *degr.* 26 *min.*

Prop. 13.

Prop. 13. *The Course and distance given, to find the differen of Longitude.*

AS the sine of 90 *d.* is to the miles run, so is the sine of you Course from South to North, to the miles you are depar ted from your first Meridian.

So if the Course be N W. by N. (which is 33 *d.* 45 *m.* from the North) the miles run 180, the number of miles which you are departed from the Merid. will be found to be 100, which if you divide by the number of miles answerable to a *d.* of longi tude in the latitude, you then find your self to be; the quoti ent gives you the *deg.* and *min.* of difference of Longitude.

Prop. 14. *The distance and departure from the Meridian given to find the Course.*

AS the miles run, to the sine of 90, so the departure from th Meridian, to the sine of your Course from N to South.

So if the departure from the Merid. be 75 miles in running 150 miles, the course steered is 30 *d.* which is *s w* by *s* Southerly

Prop. 15. *The Latitude of the place, the declination and altitud of the Sun given, to find the hour of the day:*

ADd the Suns distance from the Pole, the complement of th Latitude, and the complement of the Altitude into 1 sum and from half the sum subtract the complement of the Alti tude, noting the difference;

then, say,

1. As Radius, to the sine of the Suns distance from the Pole so the Co-sine of the Latitude, to a fourth sine——then

2. As this fourth sine, to the sine of the half sum, so th sine of the difference, to a seventh sine; unto which seventh sine, if you add the sine of 90 *deg.* half that sum will be th sine of any ark, whose complement doubled and converted in to time, is the hour required.

So if the Latitude be 51 *d.* 30 *min.* the declination 20 *degr.* Northward, and the Altitude 12 *degr.* the time will be found to be 6 hours 24 min. almost,

The

The uſe of the following Tables in Queſtions that concern Geography.

THough there be divers ways to find the diſtance of place, *viz.* by the Globe, by Maps, Geometrically, *&c.* Yet the moſt exact of all other is by Trigonometry, which way we will here lay down in three Propoſitions.

Prop. 1. *Two places differing only in* Lat. *to find their diſtance.*

In this Propoſition there are two varieties, *viz.*

1. If the two places propounded lie under one and the ſame Merid. and both of them on one ſide of the Equin. you muſt ſubſtract the leſſer Lat. from the greater, and the remainder converted into miles (by allowing 60 miles to a degree) will be the diſtance required.

Example, *Vicentia* and *Auguſta* lie under one and the ſame Meridian, and both on the North ſide of the Equinoctial; *Vicentia* having 44 *d.* 55 *m.* Latit. and *Auguſta* 47 *d.* 42 *m.* Lat. the difference of Lat. is 2 *d.* 47 *m.* which converted into miles, by multiplying it by 60, and adding thereto the odd *min.* maketh 167 miles, and that is their diſtance.

2. If one place lie on the North, and the other on the South ſide of the Equin. (yet both under the ſame Meridian) you muſt then add both the Latitudes together, and the ſum converted into miles, will give their diſtance.

Prop. 2. *Two places differing only in* Longitude, *being given, to find their diſtance.*

In this Propoſition alſo there are two varieties.

2. If the two places propounded lie undre the Equin. then the difference of their Long. reduced into miles (allowing 60 miles to a degree) giveth the diſtance of the places required.

Eaxample. It is required to know the diſtance of the Iſland *Sumatra* from the Iſland St. *Thoma*, both lying under the Equ: the Iſland *Sumatra* hath Long. 137 *d.* 10 *m.* and the Iſland of St. *Thoma* hath Long. 33 *d.* 10 *m.* therefore the difference of their Long. is 104 *d.* which multiplied by 60 maketh 6240 miles, which is the diſtance of the ſaid places.

2. But

2. But if the two places propounded differ only in Long and lie not under the Equin. but under ſome other intermediate Parallel, between the Equin. and one of the Poles, then to find there diſtance, the Proportion will be,

As Radius, or 90 *deg.* is to the Co-ſine of the common Latitude:

So is the ſine of half the difference of Longitude, to the ſine of half their diſtance.

Example. The Cities of *Compoſtella* aud *Conſtantinople* have both one Latitude, *viz.* 43 *d.* 0 *m.* but differ in Longitude 43 *d.* 15 *m.* The compl. of their Latitude is 47 *d.* and the half Longitude is 21 *d.* 37 *m.* *ſeconds*; therefore the operation is thus to be framed.

As the Radius or ſiine of 90 *degr.*	10,00000
To the Co-ſine of the common Latitude 47 *d.*	9,86412
So the ſine or the half difference of Long. 21 *d.* 37 *m.* 30 *ſ.*	9,56646
To the ſine of half their diſtanee,	9,43059

whoſe arch 15 *d.* 38 *m.* being doubled, giveth 31 *d.* 16 *m.* which converted into miles (as before is taught) giveth 1876, which is the diſtance between the two places required.

Prop. 3. *Two places being given, which differ both in Longitude and Latitude, to find their diſtance.*

In this Propoſition is contained three varieties.

1. If one place be under the Equinoctial Circle, and the other toward either Pole, then the Proportion is,

As the Radius or ſine of 90 degrees

Is to the Co-ſine of the difference of Longitude:

So is the Coſine of the Latitude given,

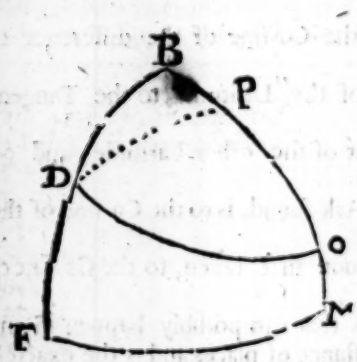
To the Co-ſine of their diſtance required.

Example

If it was required to find the diſtance of the Iſland of *St. Thoma* (which lieth directly under the Equinoctial, and hath Longitude 38 *d.*) and the City of *London* (which hath 51 *d.* 30 *m* Latitude, and 80 *d.* Longitude) their diſtance will be found to be 3222 miles.

2. If

2. If both the places propounded be without the Equinoctial, and on the Northern or Southern ſide thereof, then the proportion muſt be wrought at two operations; and becauſe there is ſome difficulty therein, we have added the following Figure, which will make it perſpicuous to the meaneſt capacity.



Let D repreſent *London*, whoſe Latitude is F D 51 *degr.* 30 *min.* and Longitude 20 *degr.* 00 *min.* And let O repreſent *Jeruſalem*, whoſe Lat. M O is 31 *d.* 40 *min.* and Long. 66 *degr.* which being known, you have given (1) the ſide B D the complement of the Latitude of *London*, 38 *deg.* 30 *min.* (2) the ſide B O. the complement of the Latit. of *Jeruſalem*; 58 *d.* 20 *m.* (3) the Angle D B O (whoſe meaſure is F M) the difference of Latitude 46 *d.* 00 *m.* and it is required to find the ſide D B Therefore the proportion is,

1. As the Radius B M 90 *deg.*	10,0000000
To the Co-ſine of D B O 44 *degrees.*	9,8417713
So is the Tangent of D B 38 *deg.* 30 *min.*	9,9006052
To the tangent of B P 28 *deg.* 55 *min.*	9,7423504

Which being ſubſtracted from B O 58 *degr.* 20 *min.* there remain O P 29 *degr.* 25 *min* then ſay,

2. As the Co-ſine of B P 61 *deg.* 5 *min.*	9,9421688
To the Co-ſine of P O 60 *deg.* 35 *min.*	9,9400535
So is the Co-ſine of D B 51 *deg.* 30 *min.*	9,8935443
	19,8335978

To

To the Co-ſine of D O 51 *d.* 9 *min.* 9,8914290
whoſe complement is 38 *d.* 51 *m.* which converted into miles as before is taught, *facit* 2331 miles, and ſuch is the diſtance required.

3. If the two places propounded differ both in Longitude and Latitude, and be both of them without the Equinoctial, and one of them towards the North, and the other towards the South Pole, then the proportion is,

1. As the Radius is to the Co-ſine of the difference of Longitude;

So is the Co-tangent of one of the Latitudes, to the Tangent of another Ark.

Which being ſubſtracted out of the other Latitude, and 90 *deg.* added thereto, ſay,

2. As the Co-ſine of the Ark found, is to the Co-ſine of the Ark remaining;

So is the Co ſine of the Latitude firſt taken, to the Co-ſine of the diſtance.

Theſe are all the varieties that can poſſibly happen in any Propoſition concerning the diſtance of places, and is the exacteſt way that can be invented, provided the Longitude and Latitude be truly given.

A Table of the *Latitude* and *Longitude* of the Principal Ports, Capes and Islands in the World, beginning from the Meridian of *Pico Teneriffa*, newly corrected.

Note, the Places marked with *S.* are in South Latitude, the rest North	*Latit.*		*Longit.*	
	D.	M.	D.	M.
Point Look-out, in Greenland	77	10	39	55
Ice Point, in Nova Zembla	77	05	98	55
Archangel	65	30	64	35
North-Cape	71	38	44	45
Naze of Norway	58	11	33	22
Stolkholme	59	20	39	05
Copenhagen	55	43	33	05
Elsenore	56	40	25	48
The Texel	53	03	26	37
Amsterdam	52	21	25	00
The Bril	51	55	23	50
Calice	51	00	22	57
Merchants Fore-land in Island	63	36	358	05
Shotland	60	22	14	40
Isles of Orkney	58	50	13	30
Catneſs	58	41	15	25
Buchaneſs	58	04	16	47
Kinmouth	55	12	18	55
Flamborough Head	54	12	19	23
Berferdneſs	52	24	21	49
London	51	32	20	25
The North Foreland	51	36	21	25
The South Foreland	51	26	21	03
Dongeneſs	41	13	20	37
Isle of Wight	50	41	19	05
Portland	50	37	18	06

	Latit.		Longit.	
	D.	M.	D.	M.
The Start	50	44	17	29
The Lizard	50	10	15	00
Islands of Scilly	50	36	14	00
St David's Head	51	40	15	31
Holy Head	54	30	13	57
Isle of Man	54	11	15	58
Fair Foreland in Ireland	55	21	14	29
Sline Head	53	02	10	13
Cape Clear	51	03	10	41
Dublin	53	11	13	25
Sain Head	50	00	18	24
Cape Hage	50	00	16	39
Garnsey	49	39	15	54
Jersey	49	26	16	20
Ushant	48	36	12	50
Breſt	47	41	16	53
Cape Ortegal	44	04	10	50
Cape Finiſterre	43	06	08	32
Lisbon	38	40	09	55
Cape Vincent	37	00	19	55
Straits of Gibraltar	35	50	13	15
Cape de Gata	36	35	09	23
Cape Melle	43	39	19	59
Ligorn	43	18	31	28
Rome	47	54	34	15
Naples	41	05	36	17
Scanderoon	36	56	63	31
Tunis	35	18	30	26
Tangier	25	25	13	20
Cape Paſſaro in Sicilia	36	39	36	31
Zant	36	42	41	48
Cape de Geer	29	56	06	38
Cape de Verde	14	26	359	00
Cape Negro	16	00S	29	55
Cape Bona Eſperance	34	30S	37	15

	Latitude		Longitude	
	D.	M.	D.	M.
Fyal	38	55	348	31
Tercera	39	56	351	00
Pico Tenerriffa	28	42	00	00
Madera	32	25	00	05
Canaria	28	00	00	33
Isle de Maya	14	49	353	17
Isle de Sall	16	50	353	44
Cape Corintes, in East-India	23	36S	341	30
Cape de Gardissn	12	15	74	55
Cape Rasalgate	22	26	84	55
Surrat	21	10	97	00
Goa in East-India	15	40	97	55
Cape Comorin	07	28	100	35
South end of St. Lawrence	25	30S	64	30
North end of St. Lawrence	12	15S	69	30
Bantam in Java	06	16S	125	40
Achem at the N.W. Point of Sumatra	05	55	116	05
Macaffer on the South end of Celebes	05	30S	139	40
North Point of Jaram	40	05	163	20
Straits of Anian in the South Sea	57	14	241	26
West entrance of Magellan	52	53	291	00
Surrinam	06	00	333	40
Cape of Florida	24	30	295	40
Cape Fair	34	08	299	40
Cape Charles	37	22	302	16
Plimouth in New-England	42	00	311	49
Cape Cod	41	50	313	05
Hudson's Straits	60	30	308	55
Bermudas	32	30	318	05
St. Christophers	17	30	319	20
Barbados	13	24	319	45
Nevis	16	42	317	48
Cape Nisolas in Hispaniola	19	57	294	54
Port Royal in Jamaica	18	15	297	00
The Havin in Cuba	28	18	294	39

The use of the Tables of the Sun and Stars Right Ascension.

AT the end of this Book, you have two Tables, the one shewing the Right Ascension of the Sun every day in the Year; the other shewing the Right Ascension and Declination of certain of the most eminent fixed Stars. I will in this place shew how by the joynt use of these two Tables, you may find when any Star mentioned in the Table of Stars will come to the Meridian, and the Rule will hold general for any Star, whose Right Ascension and Declination is known. The manner of working is as followeth.

The RULE.

Subtract the right Ascension of the Sun from the right Ascension of the Star, (whose time of coming to the Meridian is required) the Remainer is the time of the said Stars coming to the Meridian, Afternoon: but if the Right Ascension of the Star be less than the Right Ascension of the Sun, add twenty four hours thereunto, and Subtract the Right Ascension of the Sun therefrom, the Remainer is the time of the Stars coming to the Meridian.

Example.

Upon the 11*th* of *December*, it is required to know when the *Bulls eye* comes to the Meridian? By your Tables of the Suns right Ascension, you find that the Suns right Ascension on the 11*th* of *December*, is 17 *h.* 59 *m.* and by your Table of Stars you find the right Ascension of the *Bulls eye* to be 4 *h.* 10 *m.* Now (according to your Rule) because the right Ascension of the Sun is more than the right Ascension of the Star,

and

nd Subtraction cannot be made, you muſt add 24 *h.* the Stars Declination, ſo will the ſum be 28 *h.* 10 from which take 17 *h* 50. *m.* the right Aſcenſion of e Sun, the Remainer will be 10 *h.* 11 *m.* at which me the *Bulls eye* will come to the Meridian on the 11 *th December* after the Sun, that is, at 11 *m.* paſt 18 at ght the *Bulls eye* will be due South; the like of any her Star whoſe right Aſcenſion is known. See the fol-wing work.

	ho. min.
ight Aſcenſion of the Sun on the 11 *th* of *Decem.*	17 50
ight Aſcenſion of the *Bulls eye.*	4 10
wenty four Hours added.	24 00
he Sum.	28 10
he Suns Right Aſcenſion ſubtracted.	17 50
emains.	10 11

he true time that the *Bulls eye* will come to the Meri-dian.

This Rule here delivered is of excellent uſe for *Seamen*, ereby to find their Latitude; for it is to be noted, that e Rules which you obſerve for finding of your Latitude the Sun, the ſame may be performed by the Stars, they eing upon the Meridian, as is already noted in the ſt Page of my *Doctrine of Triangles*, to which I refer ou.

The Altitude of any known Star being given, to find thereby the Hour of the Night.

BY the former Rule find the time of the known Stars coming to the Meridian on the day pro-poſed. Then ſeek out the Horary diſtance of that Star om the Meridian, which may be found by the ſame ule, as you find the hour of the day by the Sun, as in rop. 15.

The use of the Tables of the Sun and Stars Right Ascension.

AT the end of this Book, you have two Tables, the one shewing the Right Ascension of the Sun every day in the Year; the other shewing the Right Ascension and Declination of certain of the most eminent fixed Stars. I will in this place shew how by the joynt use of these two Tables, you may find when any Star mentioned in the Table of Stars will come to the Meridian, and the Rule will hold general for any Star, whose Right Ascension and Declination is known. The manner of working is as followeth.

The RULE.

Subtract the right Ascension of the Sun from the right Ascension of the Star, (whose time of coming to the Meridian is required) the Remainer is the time of the said Stars coming to the Meridian, Afternoon: but if the Right Ascension of the Star be less than the Right Ascension of the Sun, add twenty four hours thereunto, and Subtract the Right Ascension of the Sun therefrom, the Remainer is the time of the Stars coming to the Meridian.

Example.

Upon the 11*th* of *December*, it is required to know when the *Bulls eye* comes to the Meridian? By your Tables of the Suns right Ascension, you find that the Suns right Ascension on the 11*th* of *December*, is 17 *h.* 59 *m.* and by your Table of Stars you find the right Ascension of the *Bulls eye* to be 4 *h.* 10 *m.* Now (according to your Rule) because the right Ascension of the Sun is more than the right Ascension of the Star,

and

nd Subtraction cannot be made, you must add 24 *h.* the Stars Declination, so will the sun be 28 *h.* 10 from which take 17 *h* 59. *m.* the right Ascension of e Sun, the Remainer will be 10 *h.* 11 *m.* at which me the *Bulls eye* will come to the Meridian on the 11 *th* *December* after the Sun, that is, at 11 *m.* past 18 at ght the *Bulls eye* will be due South; the like of any her Star whose right Ascension is known. See the following work.

	ho. min.
ight Ascension of the Sun on the 11 *th* of *Decem.*	17 59
ight Ascension of the *Bulls eye.*	4 10
wenty four Hours added.	24 00
he Sum.	28 10
he Suns Right Ascension subtracted.	17 50
emains.	10 11

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This Rule here delivered is of excellent use for *Seamen*, hereby to find their Latitude; for it is to be noted, that he Rules which you observe for finding of your Latitude y the Sun, the same may be performed by the Stars, they ing upon the Meridian, as is already noted in the st Page of my *Doctrine of Triangles*, to which I refer ou.

The Altitude of any known Star being given, to find thereby the Hour of the Night.

BY the former Rule find the time of the known Stars coming to the Meridian on the day proposed. Then seek out the Horary distance of that Star om the Meridian, which may be found by the same ule, as you find the hour of the day by the Sun, as in rop. 15.

These things being found if the Star be on the E side, not yet come to the Meridian, the difference those two numbers of hours is the hour of the nigh If the Star be Westward past the Meridian, the sum of th number of hours is the hour of the night.

Of finding the Variation of the Compass.

By the third *Prop.* before-going, you are taught to fi the Suns amplitude; that is, how far distant the Sun seth or setteth from the true East or West points of t Horizon.

Thus if the Latitude given were 51 *deg.* 32 *min.* and t Suns Declination 15 *deg.* 10 *min.* North, the amplitu will be found to be 24 *deg.* 52 *min.* North, because t Suns declination was North.

Of the Amplitude thus found, there is often use ma at Sea, for finding the Variation of the Compass; whi is done after this manner.

Supposing the Circumference or outermost edge of t Card or Flie of the *Compass* to be divided into 370 *degr* and the points of the Needles to be placed directly und the *Flower de Luce*, or North and South Points; you to observe at Sun rising or setting, how many *degr* the Sun is from the East or West Points of the *compa* which number of *degrees* if they agree with the Amplitu found by this Position, as it is before shewed, and be on t same side, then hath the Compass no Variation; but they differ, look how many *degrees* that difference is, much is the Variation.

As for Example:

Admit I find the Amplitude to be 24 *deg.* 52 *m* Northerly, then I know that the Sun should set almo 25 *deg.* from the West to the Northward; but o serving at Sun-seting with my *Compass*, admit I find it

set but 19 *deg.* from the West Point of my *Compass* to the Northwards, then hereby I gather that the Variation of my *Compass* is almost 6 *degrees*. And thus you may find how much the Variation of the *Compass* is. Now

To find which way the Compass *Varieth.*

If the *deg.* of the *Compass* which directly respects the Sun at his rising or setting, (namely the *deg.* of Amplitude found as before) be more towards the right hand, than the Sun rising or setting, the Variation is Easterly; but if it be more towards the left hand, the Variation is Westerly: because when a mans Face is towards the North, the East is on his right hand, and the West on his left.

As in this Example, I find by the Amplitude that the Sun should be set almost 25 *degrees* from the West Point of my *Compass* Northerly; but setting the Sun, I see that the 25 *degrees* of my *Compass* is more towards the right hand than the place of Sun-set; therefore I conclude, that the Variation is Easterly.

And thus is the Variation of the *Compass* found to be almost 6 *degrees* Easterly; so that the North Point of the *Compass* shews not the true North, but Points almost 6 *degrees* to the Eastward of the North, and consequently all the other Points of the *Compass* direct more towards the the right hand, than they should do by almost 6 *degrees*, And the like in all Points to be understood, if the observation had been made at Sun-rising.

Note. It is the fittest to make these Observations when the Sun seems to be a little above the Horizon, namely, when the lower edge of the Sun seems almost to touch the Horizon, for then the Sun is in the Horizon, though by reason of his refraction and parallax he seem to be above it.

By the Altitude of any two known fixed Stars taken, when they are both in the same Azimuth, to find the height of the Pole.

FIrst say,

As the Sine of the difference of the Stars Altitudes, is to the Sine of the difference of their Right Ascension, so is the Sine of the nearer Stars distance from the apparent Pole, to the sine of an Angle to be kept.

Again, Compare the farthest Stars distance from the Pole, with the distance from the *Zenith*, and say,

As the *Radius* is to the Sine of the complement of the Angle kept; so is the Tangent of the lesser of the compared Arches to the Tangent of the first Base.

Subduct the first Base out of the greater of the two compared Arches; and the Remain shall be the second Base.

Then lastly say;

As the Sine of the complement of the first Base.

Is to the Sine of the complement of the second Base.

So is the Sine of the complement of the lesser of the two Compared Arches.

To the Sine of the height of the Pole or Latitude.

A Table shewing what Day of the week the first Day of March *will fall upon* 20 *Years.*

1676	Wednesday
1677	Thursday
1678	Friday
1679	Saturday
1680	Monday
1681	Tuesday
1682	Thursday
1683	Friday
1684	Saturday
1685	Sunday
1686	Monday
1687	Tuesday
1688	Thursday
1689	Friday
1690	Saturday
1691	Sunday
1692	Tuesday
1693	Wednesday
1694	Thursday

The Description and Use of an Universal *Almanack.*

BEfore you can well make use of this Almanack *you must know on what Day of the week the first Day of* March *falleth upon in any Year, which the Table adjoyning plainly sheweth for* 20 *Years, viz. to the Year* 1694, *which Table may be continued so far as you please, by leaving out one Day between every fourth Year; as you see done in the Years of this Table.*

The day of the week on which the first day of March *falls upon being known, the day of the Moneth for ever may be easily found, as by Example following will appear.*

A Figure of the Universal *Almanack.*

March Novem.	*August*	*May* Janua.	*October*	*April* July	Septem. Decemb.	*June* Februa.
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

The

The uſes of this Almanack are only two.

The firſt is, *Any day of the Week in any Month or Year being given, to know what day of the Month it is.*

The ſecond uſe is, *Any Year and day of any Month of that Year being given to know what day of the Week it is.*

Example of the firſt. Let it be required to know what day of the Month the firſt Munday in *Aug.* the year 1676 ſhould be.

By the firſt Table you ſhall find the firſt of *March* was *Wedneſday*. Now look in the Almanack (at the head thereof) for the Month of *Auguſt*, under which you ſhall find theſe numbers, 2, 9, 16, 23, 30, which denote, that the 2*d*, the 9*th*, the 16*th*, the 23*d*, and the 30*th* Dayes of *Auguſt* were *Wedneſdays*, becauſe the firſt of *March* was *Wedneſday*, then the 9*th* day of *Auguſt* being *Wedneſday*, the 7*th* day muſt be *Munday*, and ſo for any other Month. As in the Months of *April* or *July*, the 5*th*, 12*th*, 19*th* and 26*th* dayes of either of thoſe Monhs are *Wedneſdayes*.

Example of the ſecond. What day of the Week will the 21 day of *October* be in the Year 1678? The firſt of *March* in that Year will be *Friday*; therefore the 4, 11, 18*th* and 25*th* days of *October* are *Fridays*. Then the 18*th* being *Friday*, the 21 will be *Monday*.

Thus for every Year, that day of the Week the firſt of *March* is of, the days under any Month of that Year are of the ſame day of the Week, whether *Sunday*, *Monday*, or *Tueſday*, &c. and ſo for ever.

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MR Norwood's Doctrine of Triangles, *with the Logarithems at larg: A Book ſo wel approved of by all able Mathematicians, and Navigators, and being carefully corrected by the Author before his death, is Printed for, and ſold by* William Fiſher, *at the antient Shop at the* Poſtern Gate, *by* Tower hill, Thomas Paſſenger, *at the three Bibles on* London Bridge, R. Boulter *at the* Turks head, *and* Ralph Smith *at the Bible in* Cornhill *under the* Exchange.

A

TRIANGULAR CANON *LOGARITHMICAL:*

OR,

A *TABLE* of Artificial *Sines*, *Tangents*, and the *Complements Arithmetical of Sines* supplying the Use of *SECANTS.*

To *Radius* 10, 00000, and to every Degree and Minute of the *Quadrant.*

LONDON,

Printed in the Year. 1679.

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THis Table of Artificial *Sines*, *Tangents*, and *Arithmetical Complements* of *Sines*, to ſupply the uſe of *Secants*, with a *Chiliad* of One Thouſand *Logarithms*, is thought fit (by Mr. *R. Norwood*, and *H. Bond*) to be Printed to the *Radius* 10,00000, that ſuch as are deſirous thereof may have it at a more reaſonable Rate, than the other larger *Tables* are at; and becauſe it is in a portable Volume, and is of the ſame uſe that the other *Tables* are: For by theſe *Tables* may be reſolved all plain and *Spherical Triangles*, and all *Problems* of Sailing, either according to the plain *Sea-Chart*, or according to *Mercator*'s *Chart* (without any other Meridional Parts, than what are contained in theſe *Tables*) as it may partly appear, if you look in the latter end of the *Appendix* of the *Pathway to perfect Sailing*, now newly Printed, *Vale*.

0	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of side.	Com: ar. of, si. co.
0	0	1000000	0	Infinite	60	1000000	000000
1	546372	999999	646372	1353627	59	353627	000000
2	676475	999999	676475	1323524	58	323522	000000
3	694084	999999	694084	1305915	57	305915	000000
4	706578	999999	706578	1293421	56	293421	000000
5	716269	999999	716269	1283730	55	283730	000000
6	724187	999999	724187	1275812	54	275812	000000
7	730882	999999	730882	1269117	53	269117	000000
8	736681	999999	736681	1263318	52	263318	000000
9	741796	999999	741796	1258203	51	258203	000000
10	746372	999999	746372	1253627	50	253627	000000
11	750511	999999	750512	1249487	49	249488	000000
12	754290	999999	754290	1245709	48	245709	000000
13	757766	999999	757767	1242232	47	242233	000000
14	760985	999999	760985	1239014	46	239014	000000
15	763981	999999	763982	1236017	45	236018	000000
16	766784	999999	766784	1233215	44	233215	000000
17	769417	999999	769417	1230582	43	230582	000000
18	771899	999999	771900	1228099	42	228100	000000
19	774247	999999	774248	1225751	41	225752	000000
20	776475	999999	776476	1223523	40	223524	000000
21	778594	999999	778595	1221404	39	221405	000000
22	780614	999999	780615	1219384	38	219385	000000
23	782545	999999	782546	1217453	37	217454	000000
24	784393	999998	784394	1215605	36	215606	000000
25	786166	999998	786167	1213832	35	213833	000000
26	787869	999998	787870	1212129	34	212130	000000
27	789508	999998	789509	1210490	33	210491	000000
28	791087	999998	791089	1208910	32	208912	000000
29	792611	999998	792613	1207386	31	207388	000000
30	794084	999998	794085	1205914	30	205915	000000
	Sine Comple.	Sine.	Tangent Comple.	Tang.	89		

	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine	Com. ar. of si. co.
0	794084	999998	794085	1205914	30	205915	000001
1	795508	999998	795509	1204490	29	204491	000001
2	796886	999998	796888	1203111	28	203113	000001
3	798223	999998	798225	1201774	27	201776	000002
4	799519	999997	799521	1200478	26	200480	000002
5	800778	999997	800780	1199219	25	199221	000002
6	802002	999997	802004	1197995	24	197997	000002
7	803191	999997	803194	1196805	23	196808	000002
8	804350	999997	804352	1195647	22	195649	000002
9	805478	999997	805480	1194519	21	194521	000002
10	806577	999997	806580	1193419	20	193422	000002
11	807649	999996	807653	1192346	19	192350	000003
12	808696	999996	808699	1191300	18	191303	000003
13	809718	999996	809721	1190278	17	190281	000003
14	810716	999996	810720	1189279	16	189283	000003
15	811692	999996	811696	1188303	15	188307	000003
16	812647	999996	812650	1187349	14	187352	000003
17	813581	999995	813585	1186414	13	186418	000004
18	814495	999995	814499	1185500	12	185504	000004
19	815390	999995	815395	1184604	11	184609	000004
20	816268	999995	816272	1183727	10	183731	000004
21	817128	999995	817132	1182867	9	182871	000004
22	817971	999995	817976	1182023	8	182028	000004
23	818798	999994	818803	1181196	7	181201	000005
24	819610	999994	819615	1180384	6	180389	000005
25	820407	999994	820412	1179587	5	179592	000005
26	821189	999994	821195	1178804	4	178810	000005
27	821958	999994	821964	1178035	3	178041	000005
28	822713	999993	822719	1177280	2	177286	000006
29	823455	999993	823462	1176537	1	176544	000006
30	824185	999993	824192	1175807	0	175814	000006
	Sine Comple.	Sine.	Tangent Comple.	Tang.			

0	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of side.	Com. ar. of, si. co.
0	0	1000000	0	Infinite	60	1000000	000000
1	546372	999999	646372	1353627	59	353627	000000
2	676475	999999	676475	1323524	58	323522	000000
3	694084	999999	694084	1305915	57	305915	000000
4	706578	999999	706578	1293421	56	293421	000000
5	716269	999999	716269	1283730	55	283730	000000
6	724187	999999	724187	1275812	54	275812	000000
7	730882	999999	730882	1269117	53	269117	000000
8	736681	999999	736681	1263318	52	263318	000000
9	741796	999999	741796	1258203	51	258203	000000
10	746372	999999	746372	1253627	50	253627	000000
11	750511	999999	750512	1249487	49	249488	000000
12	754290	999999	754290	1245709	48	245709	000000
13	757766	999999	757767	1242232	47	242233	000000
14	760985	999999	760985	1239014	46	239014	000000
15	763981	999999	763982	1236017	45	236018	000000
16	766784	999999	766784	1233215	44	233215	000000
17	769417	999999	769417	1230582	43	230582	000000
18	771899	999999	771900	1228099	42	228100	000000
19	774247	999999	774248	1225751	41	225752	000000
20	776475	999999	776476	1223523	40	223524	000000
21	778594	999999	778595	1221404	39	221405	000000
22	780614	999999	780615	1219384	38	219385	000000
23	782545	999999	782546	1217453	37	217454	000000
24	784393	999998	784394	1215605	36	215606	000000
25	786166	999998	786167	1213832	35	213833	000000
26	787869	999998	787870	1212129	34	212130	000000
27	789508	999998	789509	1210490	33	210491	000000
28	791087	999998	791089	1208910	32	208912	000000
29	792611	999998	792613	1207386	31	207388	000000
30	794084	999998	794085	1205914	30	205915	000000
	Sine Comple.	Sine.	Tangent Comple.	Tang.	89		

	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine	Com. ar. of ſi. co.
0	794084	999998	794085	1205914	30	205915	000001
1	795508	999998	795509	1204490	29	204491	000001
2	796886	999998	796888	1203111	28	203113	000001
3	798223	999998	798225	1201774	27	201776	000002
4	799519	999997	799521	1200478	26	200480	000002
5	800778	999997	800780	1199219	25	199221	000002
6	802002	999997	802004	1197995	24	197997	000002
7	803191	999997	803194	1196805	23	196808	000002
8	804350	999997	804352	1195647	22	195649	000002
9	805478	999997	805480	1194519	21	194521	000002
10	806577	999997	806580	1193419	20	193422	000002
11	807649	999996	807653	1192346	19	192350	000003
12	808696	999996	808699	1191300	18	191303	000003
13	809718	999996	809721	1190278	17	190281	000003
14	810716	999996	810720	1189279	16	189283	000003
15	811692	999996	811696	1188303	15	188307	000003
16	812647	999996	812650	1187349	14	187352	000003
17	813581	999995	813585	1186414	13	186418	000004
18	814495	999995	814499	1185500	12	185504	000004
19	815390	999995	815395	1184604	11	184609	000004
20	816268	999995	816272	1183727	10	183731	000004
21	817128	999995	817132	1182867	9	182871	000004
22	817971	999995	817976	1182023	8	182028	000004
23	818798	999994	818803	1181196	7	181201	000005
24	819610	999994	819615	1180384	6	180389	000005
25	820407	999994	820412	1179587	5	179592	000005
26	821189	999994	821195	1178804	4	178810	000005
27	821958	999994	821964	1178035	3	178041	000005
28	822713	999993	822719	1177280	2	177286	000006
29	823455	999993	823462	1176537	1	176544	000006
30	824185	999993	824192	1175807	0	175814	000006
	Sine Comple.	Sine.	Tangent Comple.	Tang.			

1	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of tang.
0	824185	999993	824192	1175807	60	175814	000006
1	824903	999993	824910	1175089	59	175096	000006
2	825609	999992	825616	1174383	58	174390	000006
3	826304	999992	826311	1173688	57	173695	000006
4	826988	999992	826995	1173004	56	173011	000005
5	827661	899992	827669	1172330	55	172338	000005
6	828324	999992	828332	1171667	54	171675	000005
7	828977	999991	828985	1171014	53	171022	000005
8	829620	999991	829629	1170370	52	170379	000005
9	830254	999991	830263	1169736	51	169745	000005
10	830879	999991	830888	1169111	50	169120	000005
11	831495	999990	831504	1168495	49	168504	000005
12	832102	999990	832112	1167887	48	167897	000005
13	832701	999990	832711	1167288	47	167298	000005
14	833292	999989	833302	1166697	46	166707	000014
15	833875	999989	833885	1166114	45	166124	000014
16	834450	999989	834461	1165538	44	165549	000014
17	835018	999989	835028	1164971	43	164981	000014
18	835578	999988	835589	1164410	42	164421	000014
19	836131	999988	836142	1163857	41	163868	000014
20	836677	999988	836689	1163310	40	163322	000014
21	837217	999987	837229	1162770	39	162782	000014
22	837749	999987	837762	1162237	38	162250	000014
23	838276	999987	838288	1161711	37	161723	000014
24	838796	999987	838809	1161190	36	161203	000014
25	839310	999986	839323	1160676	35	160689	000014
26	839817	999986	839831	1160168	34	160182	000014
27	840319	999986	840333	1159666	33	159680	000014
28	840816	999985	840830	1159169	32	159183	000014
29	841306	999985	841321	1158678	31	158693	000014
30	841791	999985	842806	1158193	30	158208	000014
	Sine Comple.	Sine.	Tangent comple.	Tang.	88		

	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ti. co.
0	841791	999985	841806	1158193	30	158208	000014
1	842271	999984	842286	1157713	29	157728	000015
2	842746	999984	842761	1157238	28	157253	000015
3	843215	999984	843231	1156768	27	156784	000015
4	843679	999983	843696	1156303	26	156320	000016
5	844139	999983	844156	1155843	25	155860	000016
6	844594	999983	844611	1155388	24	155405	000016
7	845044	999982	845061	1154938	23	154955	000017
8	845489	999982	845506	1154493	22	154510	000017
9	845930	999981	845948	1154051	21	154089	000018
10	846366	999981	846384	1153615	20	153633	000018
11	846798	999981	846817	1153182	19	153201	000018
12	847226	999980	847245	1152754	18	152773	000019
13	847649	999980	847669	1152330	17	152350	000019
14	848069	999980	848089	1151910	16	151930	000019
15	848484	999979	848505	1151494	15	151515	000020
16	848896	999979	848916	1151083	14	151103	000020
17	849303	999978	849325	1150674	13	150696	000021
18	849707	999978	849729	1150270	12	150292	000021
19	850104	999978	850129	1149870	11	149892	000021
20	850504	999977	850526	1149473	10	149495	000022
21	852897	999977	850920	1149079	9	149102	000022
22	851286	999976	851309	1148690	8	148713	000023
23	851672	999976	851696	1148303	7	148327	000023
24	852055	999976	852079	1147920	6	147944	000023
25	852434	999975	852458	1147541	5	147565	000024
26	852810	999975	852834	1147165	4	148189	000024
27	853182	999974	853207	1145792	3	146817	000025
28	863552	999974	853577	1146422	2	146447	000025
29	853918	999973	853944	1146055	1	146081	000026
30	854281	999973	854308	1145691	0	145718	000026
	Sine Comple.	Sine.	Tangent Comple.	Tang.	88		

I	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. ca.
0	854281	999973	854308	1146691	60	145718	000026
1	854642	999973	854669	1145330	59	145357	000026
2	854999	999972	855026	1144973	58	145000	000027
3	855353	999972	855381	1144618	57	144646	000027
4	855705	999971	855733	1144266	56	144294	000028
5	856054	999971	856082	1143917	55	143945	000028
6	856399	999970	856429	1143570	54	143600	000029
7	856743	999970	856772	1143227	53	143216	000029
8	857083	999969	857113	1142886	52	142916	000030
9	857421	999969	857451	1142548	51	142578	000030
10	857756	999968	857787	1142212	50	142243	000031
11	858089	999967	858120	1141879	49	141910	000031
12	858419	999967	858451	1141548	48	141580	000032
13	858746	999967	858779	1141220	47	141253	000032
14	859072	999967	859105	1140894	46	140927	000033
15	959394	999966	859428	1140571	45	140605	000033
16	859715	999966	859749	1140250	44	140284	000033
17	860033	999965	860067	1139932	43	139966	000034
18	860348	999965	860383	1139616	42	139651	000035
19	860662	999964	860697	1139302	41	139337	000035
20	860973	999963	861009	1138990	40	139026	000036
21	861282	999963	861318	1138681	39	138717	000036
22	861589	999962	861626	1138373	38	138410	000037
23	861893	999962	861931	1138068	37	138106	000037
24	862196	999961	862234	1137765	36	137803	000038
25	862496	999961	862535	1137464	35	137503	000038
26	862794	999960	862834	1137165	34	137205	000039
27	863091	999960	863130	1136869	33	136908	000039
28	863385	999959	863425	1136574	32	136614	000040
29	863677	999959	863718	1136281	31	136322	000040
30	863967	999958	864009	1135990	30	136032	000041
	Sine Comple.	Sine.	Tangent Comple.	Tang.	87		

	Sine.	Sine Comple.	Tang.	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
30	863967	999958	864009	1135990	30	136032	000041
31	864256	999958	864298	1135701	29	135743	000041
32	864542	999957	864585	1135414	28	135457	000042
33	864827	999956	864870	1135129	27	135172	000043
34	865110	999956	865153	1134846	26	134889	000043
35	865391	999955	865435	1134564	25	134608	000044
36	865670	999955	865714	1134285	24	134420	000044
37	865947	999954	865992	1134007	23	134052	000045
38	866223	999954	866268	1133731	22	133776	000045
39	866496	999953	866543	1133456	21	133503	000046
40	866768	999952	866815	1133194	20	133231	000047
41	867039	999952	867086	1132913	19	132960	000047
42	867308	999951	867356	1132643	18	132691	000048
43	867575	999951	867623	1132376	17	132424	000048
44	867840	999950	867889	1132110	16	132159	000049
45	868104	999949	868154	1131845	15	131895	000050
46	868356	999948	868417	1131582	14	131633	000050
47	868627	999948	868678	1131321	13	131372	000051
48	868886	999947	868938	1131061	12	131113	000051
49	869143	999947	869196	1130803	11	130856	000052
50	869399	999946	869452	1130548	10	130600	000053
51	869654	999946	869708	1130291	9	130345	000053
52	869907	999945	869961	1130038	8	130092	000054
53	870158	999944	870213	1129786	7	129841	000055
54	870408	999944	870474	1129535	6	129591	000055
55	870657	999943	870713	1129287	5	129342	000056
56	870904	999943	870961	1129039	4	129095	000056
57	871150	999942	871208	1128791	3	128849	000057
58	871395	999941	871453	1128546	2	128604	000058
59	871638	999941	871697	1128302	1	128361	000058
60	871880	999940	871939	1128060	0	128119	000059
	Sine Comple.	Sine.	Tangent Comple.	Tang.	87		

ʒ	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine	Com. ar. of ſi. co.
0	871880	999947	871939	1128060	60	128119	000059
1	872120	999939	872180	1127819	59	127876	000060
2	872359	999939	872420	1127579	58	127640	000060
3	872597	999938	872658	1127341	57	127402	000061
4	872833	999937	872895	1127104	56	127166	000062
5	873068	999937	873131	1126868	55	126931	000062
6	873302	999936	873366	1126633	54	126697	000063
7	873535	999935	873599	1126400	53	126464	000064
8	873766	999935	873831	1126168	52	126233	000064
9	873996	999934	874062	1125937	51	126003	000065
10	874225	999933	874292	1125707	50	125774	000066
11	874453	999932	874520	1125479	49	125546	000067
12	874680	999932	874747	1125252	48	125319	000067
13	874905	999931	874974	1125026	47	125094	000068
14	875129	999930	875198	1124801	46	124870	000069
15	875352	999930	875422	1124577	45	124647	000069
16	875574	999929	875645	1124354	44	124425	000070
17	875795	999928	875866	1124133	43	124204	000071
18	876015	999927	876087	1123912	42	123984	000072
19	876233	999927	876306	1123693	41	123766	000072
20	876451	999926	876524	1123475	40	123548	000073
21	876667	999925	876741	1123258	39	123332	000074
22	876882	999924	876957	1123042	38	123117	000075
23	877096	999924	877172	1122827	37	122903	000075
24	877310	999923	877386	1122613	36	122689	000076
25	877522	999922	877599	1122400	35	122477	000077
26	877733	999921	877811	1122188	34	122266	000078
27	877943	999921	878022	1121977	33	122056	000078
28	878152	999920	878231	1121768	32	121847	000079
29	878360	999919	878440	1121559	31	121630	000080
30	878567	999918	878648	1121351	30	121432	000081
	Sine Comple.	Sine.	Tangent Comple.	Tang.	86		

3	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine	Com. ar. of ſi. co.
30	878567	999918	878648	1121351	30	121432	000081
31	878773	999918	878855	1121144	29	121226	000081
32	878978	999917	879061	1120938	28	121021	000082
33	879182	999916	879266	1120733	27	120817	000083
34	879385	999915	879470	1120529	26	120614	000084
35	879588	999915	879673	1120326	25	120411	000084
36	879789	999914	879875	1120124	24	120210	000085
37	879989	999913	880076	1119923	23	120010	000086
38	880189	999912	880276	1119723	22	119810	000087
39	880387	999911	880475	1119524	21	119612	000088
40	880585	999911	880674	1119325	20	119414	000088
41	880781	999910	880871	1119128	19	119218	000089
42	880977	999909	881068	1118931	18	119022	000090
43	881172	999908	881264	1118735	17	118827	000091
44	881366	999907	881458	1118541	16	118633	000092
45	881559	999906	881652	1118347	15	118440	000093
46	881752	999906	881846	1118153	14	118247	000093
47	881943	999905	882038	1117961	13	118056	000094
48	882134	999904	882229	1117770	12	117865	000095
49	882324	999903	882420	1117579	11	117675	000096
50	882512	999902	882610	1117389	10	117487	000097
51	882701	999901	882799	1117200	9	117298	000098
52	882888	999901	882987	1117012	8	117111	000098
53	883074	999900	883175	1116825	7	116926	000099
54	883260	999899	883361	1116638	6	116739	000100
55	883445	999898	883547	1116452	5	116554	000101
56	883629	999897	883732	1116267	4	116370	000102
57	883813	999896	883916	1116083	3	116186	000103
58	883995	999895	884099	1115900	2	116004	000104
59	884177	999894	884282	1115717	1	115822	000105
60	884358	999894	884464	1115535	0	115641	000105
	Sine Comple	Sine.	Tangent Comple.	Tang.	86		

4	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine	Com. ar. of ſi. co.
0	884358	999894	884464	1115535	60	115641	000105
1	884538	999893	884645	1115354	59	115461	000106
2	884718	999892	884825	1115174	58	115281	000107
3	884897	999891	885005	1114994	57	115102	000108
4	885075	999890	885184	1114815	56	114924	000109
5	885252	999889	885362	1114463	55	114747	000110
6	885429	999888	885540	1114459	54	114570	000111
7	885604	999887	885717	1114282	53	114395	000112
8	885780	999886	885893	1114106	52	114219	000113
9	885954	999885	886068	1113931	51	114045	000114
10	886128	999885	886243	1113756	50	113871	000114
11	886301	999884	886417	1113582	49	113698	000115
12	886473	999883	886592	1113409	48	113526	000116
13	886645	999882	886763	1113236	47	113354	000117
14	886816	999881	886935	1113064	46	113183	000118
15	886986	999880	887106	1112893	45	113013	000119
16	887156	999879	887276	1112723	44	112843	000120
17	887325	999878	887446	1112553	43	112674	000121
18	887493	999877	887616	1112383	42	112506	000122
19	887661	999876	887784	1112215	41	112338	000123
20	887828	999875	887952	1112047	40	112171	000124
21	887994	999874	888120	1111875	39	112005	000125
22	888160	999873	888286	1111713	38	111839	000126
23	888325	999872	888453	1111546	37	111674	000127
24	888490	999871	888618	1111381	36	111509	000128
25	888654	999870	888783	1111216	35	111345	000129
26	888817	999869	888947	1111052	34	111182	000130
27	888980	999868	889111	1110888	33	111019	000131
28	889142	999867	889274	1110725	32	110857	000132
29	889303	999866	889436	1110563	31	110696	000133
30	889464	999865	889593	1110401	30	110535	000134
	Sine Comple.	Sine.	Tangent Comple.	Tang.	85		

	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of si. co.
0	889464	999865	889598	1110401	30	110535	000134
1	889624	999864	889759	1110240	29	110375	000135
2	889784	999863	889920	1110079	28	110215	000136
3	889943	999862	890080	1109919	27	110056	000137
4	890101	999861	890239	1109760	26	109898	000138
5	890259	999860	890398	1109601	25	109740	000139
6	890416	999859	890556	1109443	24	109583	000140
7	890573	999858	890714	1109285	23	109426	000141
8	890729	999857	890871	1109128	22	109270	000142
9	890885	999856	891028	1108971	21	109114	000143
10	891040	999855	891184	1108815	20	108959	000144
11	891194	999854	891340	1108659	19	108805	000145
12	891348	999853	891495	1108504	18	108651	000146
13	891502	999852	891649	1108350	17	108497	000147
14	891655	999851	891803	1108196	16	108344	000148
15	891807	999850	891956	1108043	15	108192	000149
16	871959	999849	892109	1107890	14	108040	000150
17	892110	999848	892261	1107738	13	107889	000151
18	892261	999847	892413	1107586	12	107738	000152
19	892411	999846	892564	1107435	11	107588	000153
20	892560	999845	892715	1107284	10	107439	000154
21	892710	999844	892865	1107134	9	107289	000155
22	892858	999843	893015	1106984	8	107141	000156
23	893006	999842	893164	1106835	7	106993	000157
24	893154	999840	893313	1106686	6	106845	000159
25	893301	999839	893461	1106538	5	106698	000160
26	893448	990838	893609	1106390	4	196551	000161
27	893594	999837	893756	1106243	3	106405	000162
28	893730	999836	893903	1106096	2	106260	000163
29	893884	999835	894049	1105950	1	106115	000164
30	894029	999834	894195	1105804	0	105970	000165
	Sine Comple.	Sine.	Tangent Comple.	Tang.	85		

5	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
0	894029	999834	894195	1105804	60	105970	000165
1	894173	999833	894340	1105659	59	105826	000166
2	894317	999832	894485	1105514	58	105682	000167
3	894460	999831	894629	1105370	57	105539	000168
4	894603	999829	894773	1105226	56	105396	000170
5	894745	999828	894916	1105083	55	105254	000171
6	894887	999827	895059	1104940	54	105112	000172
7	895028	999826	895202	1104797	53	104971	000173
8	895169	999825	895344	1104655	52	104830	000174
9	895309	999824	895485	1104514	51	104690	000175
10	895449	999823	895626	1104373	50	104550	000176
11	895589	999822	895767	1104232	49	104410	000177
12	895728	999820	895907	1104092	48	104271	000179
13	895867	999819	896047	1103952	47	104132	000180
14	896005	999818	896186	1103813	46	103994	000181
15	896142	999817	896325	1103674	45	103857	000182
16	896280	999816	896463	1103536	44	103719	000183
17	896416	999815	896601	1103398	43	103583	000184
18	896553	999813	896739	1103260	42	103446	000186
19	896689	979812	896876	1103123	41	103310	000187
20	896824	999811	897013	1102986	40	103175	000188
21	896959	999810	897146	1102850	39	103050	000189
22	897094	999809	897285	1102714	38	102905	000190
23	897228	999808	897420	1102579	37	102771	000191
24	897362	999806	897555	1102444	36	102637	000193
25	897496	999805	897690	1122309	35	102503	000194
26	897629	999804	897824	1102175	34	102370	000195
27	897761	999803	897958	1102141	33	102238	000196
28	897894	999802	898092	1101907	32	102105	000197
29	898025	999800	898225	1101774	31	101974	000199
30	898157	999799	898357	1101642	30	101842	000200
	Sine Comple.	Sine.	Tangent Comple.	Tang.	84		

	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine	Com. ar. of si. co.
0	8981 57	999799	898357	1101642	30	101842	000200
1	898288	999798	898489	1102510	29	101711	000201
2	898418	999797	898621	1101378	28	101581	000202
3	898549	999795	898753	1101246	27	101450	000204
4	898678	999794	898884	1101115	26	101321	000205
5	898808	999793	899014	1100985	25	101191	000206
6	898937	999792	899145	1100854	24	101062	000207
7	899066	999790	899275	1100724	23	100933	000209
8	899194	999789	899404	1100595	22	100805	000210
9	899322	999788	899533	1100466	21	100677	000211
10	899449	999787	899662	1100337	20	100550	000212
11	899576	999785	899790	1100209	19	100423	000214
12	899703	999784	899918	1100081	18	100296	000215
13	899829	999783	900046	1099953	17	100170	000216
14	899955	999782	200173	1099826	16	100044	000217
15	900081	999780	900300	1099699	15	099918	000219
16	900206	999779	900427	1099572	14	099793	000220
17	900331	999778	900553	1099446	13	099668	000221
18	900456	999777	900679	1099320	12	099543	000222
19	900580	999775	900804	1099195	11	099419	000224
20	900704	999774	900929	1099070	10	099295	000225
21	900827	999773	901054	1098945	9	099172	000226
22	900950	999771	901179	1098820	8	099049	000228
23	901073	999770	901303	1098696	7	098926	000229
24	901196	999769	901426	1098573	6	098803	000230
25	901318	999768	901550	1098445	5	098681	000231
26	901439	999766	901673	1098326	4	098560	000233
27	901561	999765	901795	1098204	3	098438	000234
28	901682	999764	901918	1098081	2	098317	000235
29	901803	999762	902040	1097959	1	098196	000237
30	901923	999761	902162	1097837	0	098076	000238
	Sine Comple.	Sine.	Tangent Comple.	Tang.	84		

6	Sine.	Sine Comple.	Tang	Tangent Complem.	′	Com. ar. of sine.	Com. ar. of ſi. co.
0	901923	999761	902162	1097837	60	098076	000238
1	902043	999760	902283	1097716	59	097956	000239
2	902163	999758	902404	1097595	58	097836	000241
3	902282	999757	902525	1097474	57	097717	000242
4	902401	999756	902645	1097354	56	097598	000243
5	902520	999754	902765	1097234	55	097479	000245
6	902638	999753	902885	1097114	54	097361	000246
7	902756	999752	903004	1096995	53	097243	000247
8	902874	999750	903123	1096876	52	097125	000249
9	902991	999749	903242	1096757	51	097008	000250
10	903108	999747	903360	1096639	50	096891	000252
11	903225	999746	903479	1096520	49	096774	000253
12	903342	999745	903596	1096403	48	096657	000254
13	903458	999743	903714	1096285	47	096541	000256
14	903574	999742	903831	1096168	46	096425	000257
15	903689	999741	903948	1096051	45	096310	000258
16	903804	999739	904065	1095934	44	096195	000260
17	903919	999738	904181	1095818	43	096080	000261
18	904034	999736	904297	1095702	42	095965	000263
19	904148	999735	904412	1095587	41	095851	000264
20	904262	999734	904528	1095471	40	095737	000265
21	904376	999732	904643	1095356	39	095623	000267
22	904489	999731	904758	1095241	38	095510	000268
23	904602	999729	904872	1095127	37	095397	000270
24	904715	999728	904985	1095013	36	095284	000271
25	904827	999727	905100	1094899	35	095172	000272
26	904940	999725	905214	1094785	34	095059	000274
27	905051	999724	905327	1094672	33	094948	000275
28	905163	999722	905440	1094559	32	094836	000277
29	905274	999721	905553	1094446	31	094725	000278
30	905385	999719	905665	1094334	30	094614	000280
	Sine Comple.	Sine.	Tangent Comple.	Tang.	83		

Sine	Sine Comple	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of si. co.
905385	999715	905665	1094334	30	094614	000208
905496	999718	905778	1094221	29	094503	000281
905607	999717	905890	1094109	28	094392	000282
905717	999715	906001	1093998	27	094282	000284
905827	999714	906112	1093887	26	094172	000285
905936	999712	906224	1093775	25	094063	000287
906046	999711	906334	1093665	24	093953	000288
906155	999709	906445	1093554	23	093844	000290
906263	999708	906555	1093444	22	093736	000291
906372	999706	906665	1093334	21	093627	000293
906480	999705	906775	1093224	20	093519	000294
906588	999703	906884	1093115	19	093411	000296
906696	999702	906993	1093006	18	093303	000297
906803	999700	907102	1092897	17	093196	000299
906910	999699	907211	1092788	16	093089	000300
907017	999697	907319	1092680	15	092982	000302
907124	999696	907427	1092572	14	092875	000303
907230	999694	907535	1092464	13	092769	000305
907336	999693	907643	1092356	12	092663	000306
907442	999691	907750	1092249	11	092557	000308
907547	999690	907857	1092142	10	092452	000309
907653	999688	907964	1092035	9	092346	000311
907758	999687	908070	1091929	8	092241	000312
907863	999685	908177	1091822	7	092136	000314
907967	999684	908287	1091716	6	092032	000315
908071	999682	908389	1091610	5	091928	000317
908175	999681	908494	1091505	4	091824	000318
908279	999679	908599	1091400	3	091720	000320
908383	999678	908705	1091294	2	091616	000321
908486	999676	908809	1091190	1	091513	000323
908589	999675	908914	1091085	0	091410	000324
Sine Comple	Sine	Tangent Comple.	Tang.	83		

7	Sine.	Sine Complt.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of si. co
0	908589	999675	908914	1091085	60	001410	00031
1	908692	999673	909018	1090781	59	091307	00031
2	908794	999671	909122	1090877	58	091205	00031
3	908897	999670	909226	1090773	57	091103	00031
4	908999	999668	909330	1090669	56	091000	00033
5	909100	999667	909433	1090566	55	090899	00033
6	909202	999665	909536	1090463	54	090797	00033
7	909303	999664	909639	1090360	53	090696	00033
8	909404	999662	909742	1090257	52	090595	00033
9	909505	999660	909844	1090155	51	090494	00033
10	909606	999659	909946	1090053	50	090393	00033
11	909706	999657	910048	1089951	49	090293	00033
12	909806	999656	910150	1089849	48	090193	00033
13	909906	999654	910251	1089748	47	090093	00033
14	910006	999652	910353	1089646	46	089993	00033
15	918105	999651	910454	1089545	45	089894	00033
16	910204	999649	910555	1089445	44	089795	00033
17	910303	999648	910655	1089344	43	089696	00033
18	910402	999646	910755	1089244	42	089597	00033
19	910500	999644	910856	1089143	41	089499	00033
20	910599	999643	910955	1089044	40	089400	00033
21	910697	999641	911055	1088944	39	089302	00033
22	910795	999640	911155	1088844	38	089204	00033
23	910892	999638	911254	1088745	37	089107	00033
24	910990	999636	911353	1088646	36	089009	00033
25	911087	999635	911452	1088547	35	088912	00034
26	911184	999633	911550	1088449	34	088815	00033
27	911280	999631	911649	1088350	33	088719	00033
28	911377	999630	911747	1088252	32	088622	00033
29	911473	999628	911845	1088154	31	088526	00033
30	911569	999626	911942	1088057	30	088430	00033
	Sine Comple.	Sine.	Tangent Comple.	Tang.	82		

Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine	Com. ar. of ſi. co.
911569	999626	911942	1088057	30	088430	000373
911665	999625	912040	1087959	29	088334	000374
911761	999623	912137	1087862	28	088238	000376
911856	999621	912234	1087765	27	088143	000378
911951	999620	912331	1087668	26	088048	000379
912046	999618	912428	1087571	25	087952	000381
912141	999616	912524	1087475	24	087858	000383
912236	999615	912621	1087378	23	087763	000384
912330	999613	912717	1087282	22	087669	000386
912424	999611	912813	1087186	21	087575	000388
912518	999610	912908	1087091	20	087481	000389
912612	999608	913004	1086995	19	087387	000391
912706	999606	913099	1086900	18	087294	000393
912799	999604	913194	1086805	17	087200	000395
912892	999603	913289	1086710	16	087107	000396
912985	999601	913383	1086616	15	087014	000398
913078	999599	913478	1086521	14	086921	000400
913170	999598	913572	1086427	13	086829	000401
913262	999596	913666	1086333	12	086737	000403
913355	999594	913760	1086239	11	086644	000405
913447	999592	913854	1086145	10	086552	000407
913538	999591	913947	1086052	9	086461	000408
913630	999589	914040	1085959	8	086369	000410
913721	999587	914134	1085866	7	086278	000412
913812	999585	914226	1085773	6	086187	000414
913903	999584	914319	1085680	5	086096	000415
913994	999582	914412	1085587	4	086005	000417
914085	999580	914504	1085495	3	085914	000419
914175	999578	914598	1085403	2	085824	000421
914265	999577	914688	1085311	1	085734	000422
914355	999575	914780	1085219	0	085644	000424
Sine Comple.	Sine.	Tangent Comple.	Tang.	82		

9	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. of si.
0	914355	999575	914780	10852196	60	085644	00042
1	914445	999573	914871	10851285	59	085554	00042
2	914534	999571	914963	10850364	58	085465	00042
3	914624	999569	915054	10849454	57	085375	00042
4	914713	999568	915145	10848545	56	085286	00042
5	914802	999566	915236	10847635	55	085197	00042
6	914891	999564	915326	10846734	54	085108	00042
7	914980	999562	915417	10845825	53	085019	00042
8	915068	999560	915507	10844925	52	084931	00042
9	915156	999559	915597	10844025	51	084843	00041
10	915245	999557	915687	10843125	50	084754	00042
11	915333	999555	915777	10842225	49	084666	00042
12	915420	999553	915867	10841325	48	084579	00042
13	915508	999551	915956	10840435	47	084491	00042
14	915595	999550	916045	10839545	46	084404	00042
15	915682	999548	916134	10838655	45	084317	00042
16	915770	999546	916223	10837765	44	084230	00042
17	915856	999544	916312	10836875	43	084143	00042
18	915943	999542	916400	10835995	42	084059	00042
19	916030	999540	916489	10835105	41	083969	00042
20	916116	999539	916577	10834225	40	083883	00042
21	916202	999537	916665	10833345	39	083797	00042
22	916288	999535	916753	10832465	38	083711	00042
23	916374	999533	916840	10831595	37	083625	00042
24	916459	999531	916929	10830715	36	083540	00042
25	916545	999529	917015	10829845	35	083454	00042
26	916630	999527	917102	10828975	34	083369	00042
27	916715	999525	917189	10828105	33	083284	00042
28	916800	999524	917276	10827235	32	083199	00042
29	916885	999522	917363	10826365	31	083114	00042
30	916970	999520	917449	10825505	30	083029	00042
	Sine Comple.	Sine.	Tangent Complt.	Tang.	81		

8	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
0	916970	999520	917449	1082550	30	083029	000479
1	917054	999518	917536	1082463	29	082945	000481
2	917138	999516	917622	1082377	28	082861	000483
3	917223	999514	917708	1082291	27	082776	000485
4	917306	999512	917794	1082205	26	082691	000487
5	917390	999510	917879	1082120	25	082609	000489
6	917474	999508	917965	1082034	24	082525	000491
7	917557	999507	918050	1081949	23	082442	000492
8	917641	999505	918136	1081863	22	082358	000494
9	917724	999503	918221	1081778	21	082275	000496
10	917807	999501	918305	1081694	20	082192	000498
11	917890	999499	918390	1081609	19	082109	000500
12	917973	999497	918475	1081524	18	082027	000502
13	918055	999495	918559	1081440	17	081944	000504
14	918137	999493	918643	1081356	16	081862	000506
15	918219	999491	918728	1081271	15	081780	000508
16	918301	999489	918811	1081188	14	081698	000510
17	918383	999487	918895	1081104	13	081616	000512
18	918465	999485	918979	1081020	12	081534	000514
19	918546	999483	919062	1080937	11	081453	000516
20	918628	999481	919146	1080853	10	081371	000518
21	918709	999479	919329	1080770	9	081290	000520
22	918790	999477	919312	1080687	8	081209	000522
23	918871	999475	919395	1080604	7	081128	000524
24	918951	999473	919478	1080521	6	081048	000526
25	919032	999471	919560	1080439	5	080967	000528
26	919112	999469	919643	1080356	4	080887	000530
27	919193	999467	919725	1080274	3	080806	000532
28	919273	999465	919807	1080192	2	080726	000534
29	919353	999463	919889	1080110	1	080646	000536
30	919433	999461	919971	1080028	0	080566	000538
	Sine Comple.	Sine.	Tangent Comple.	Tang.	81		

9	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine	Com. ar. of ſi. co.
0	919433	999461	919971	10800028	60	080566	000538
1	919512	999459	920052	10709475	59	080487	000540
2	919592	999457	920134	10798651	58	080407	000542
3	919671	999455	920215	10797841	57	080328	000544
4	919751	999453	020297	10797021	56	080248	000546
5	919830	989451	920378	10796211	55	080169	000548
6	919909	999449	920459	10795401	54	080090	000550
7	919987	999447	920540	10794591	53	080012	000553
8	920066	999445	920620	10793791	52	079933	000554
9	920145	999443	920701	10792981	51	079854	000556
10	920223	999441	920781	10792181	50	079776	000559
11	920301	999439	920861	10791381	49	079698	000560
12	920379	999437	920942	10790571	48	079620	000562
13	920457	999435	921022	10786781	47	079542	000564
14	920535	999433	921101	10788981	46	079464	000566
15	920613	999431	921181	10788181	45	079386	000568
16	920690	999429	921261	10787381	44	079309	000570
17	920767	999427	921340	10786591	43	079232	000572
18	920845	999425	921419	10785801	42	079154	000574
19	920922	999423	921498	10785011	41	079077	000576
20	920999	999421	921577	10784221	40	079000	000578
21	921075	999419	921656	10783431	39	078924	000580
22	921152	999417	921735	10782641	38	078847	000582
23	921229	999414	921814	10781851	37	078770	000585
24	921305	999412	921892	10781071	36	078694	000587
25	821381	999410	921970	10780291	35	078618	000589
26	921457	999408	922049	10779501	34	078542	000591
27	921533	999406	922127	10778721	33	078466	000593
28	921609	999404	922205	10777941	32	078390	000595
29	921685	999402	922282	10777171	31	078314	000597
30	921760	999400	922360	10776391	30	078239	000599
	Sine Comple.	Sine.	Tangent Comple.	Tang.	80		

	Sine.	Sine Comple.	Tang.	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
5	921760	999400	922360	1077639	30	078239	000599
1	921836	999398	922438	1077561	29	078163	000601
2	921911	999396	922515	1077484	28	078088	000603
3	921988	999393	922592	1077407	27	078013	000606
4	922061	999391	922670	1077329	26	077938	000608
5	922136	999389	922747	1077262	25	077863	000610
6	922211	999387	922823	1077176	24	077788	000612
7	922286	999385	922900	1077099	23	077713	000614
8	922360	999383	922977	1077022	22	077639	000616
9	922434	999381	923053	1076946	21	077565	000618
0	922509	999378	923130	1076869	20	077490	000621
1	922583	999376	923206	1076793	19	077416	000623
2	922657	999374	923282	1076717	18	077341	000625
3	922731	999372	923358	1076641	17	077268	000627
4	922804	999370	923433	1076565	16	077195	000629
5	922878	999368	923510	1076489	15	277121	000631
6	922951	999365	923585	1076414	14	077048	000634
7	923025	999363	923661	1076338	13	076974	000636
8	923098	999361	923736	1076263	12	076901	000638
9	923171	999359	923812	1076187	11	076828	000640
0	923244	999357	923887	1076112	10	076755	000642
1	923317	999355	923962	1076037	9	076682	000644
2	923389	999352	924037	1075962	8	076610	000647
3	923461	999350	924113	1075888	7	076537	000649
4	923534	999348	924186	1075813	6	076465	000651
5	923607	999346	924261	1075738	5	076392	000653
6	923679	999344	924335	1075664	4	076320	000655
7	923751	999341	924409	1075590	3	076284	000658
8	923823	999339	924483	1075516	2	076176	000660
9	923895	999337	924557	1075442	1	076104	000662
0	923967	999335	924631	1075368	0	076032	000664
	Sine Comple.	Sine.	Tangent Comple.	Tang.	80		

10	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi.
0	923967	999335	924631	1075368	60	076032	00066
1	924038	999332	924705	1075294	59	075961	00066
2	924110	999330	924779	1075226	58	075889	00066
3	924181	999328	924852	1075147	57	075818	00067
4	924252	999326	924926	1075073	56	075747	00067
5	924323	999323	924999	1075000	55	075676	00067
6	924394	999321	925073	1074926	54	075605	00067
7	924465	999319	925146	1074853	53	075534	00068
8	924536	999317	925219	1074780	52	075463	00068
9	924606	999314	925292	1074708	51	075393	00068
10	924677	999312	925364	1074635	50	075322	00068
11	924747	999310	925437	1074562	49	075252	00068
12	924818	999308	925509	1074490	48	075181	00069
13	924888	999305	925582	1074417	47	075111	00069
14	924958	999303	925654	1074345	46	075041	00069
15	925028	999301	925726	1074273	45	074971	00069
16	925098	999299	925709	1074200	44	074901	00070
17	925167	999296	925870	1074129	43	074832	00070
18	925237	999294	925942	1074057	42	074762	00070
19	925306	999292	926014	1073985	41	074693	00070
20	925376	999289	926086	1073913	40	074623	00071
21	925445	999287	926157	1073842	39	074554	00071
22	925514	999285	926229	1073770	38	074485	00071
23	925583	999282	926300	1073699	37	074416	00071
24	925652	999280	926371	1073622	36	074347	00071
25	925721	999278	926442	1073557	35	074278	00072
26	925789	999275	926513	1073486	34	074210	00072
27	925858	999273	926584	1073415	33	074141	00072
28	925926	999271	926655	1073344	32	074073	00072
29	925995	999268	926726	1073273	31	074004	00073
30	926063	999266	926796	1073203	30	073936	00073
	Sine Comple.	Sine	Tangent Comple.	Tang.	79		

10	Sine	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ti. co.
30	926063	999266	926796	1073203	30	073936	000733
31	926131	999264	926867	1073132	29	073868	000735
32	926199	999261	926937	1073062	28	073800	000738
33	926267	999259	927007	1072992	27	073732	000740
34	926335	999257	927077	1072922	26	073664	000742
35	926402	999254	927147	1072852	25	073597	000745
36	926470	999252	927217	1072782	24	073529	000747
37	926537	999250	917287	1072712	23	073462	000749
38	926605	999247	927357	1072642	22	073394	000752
39	926672	999245	927426	1072553	21	073327	000754
40	926739	999243	927496	1072503	20	073260	000756
41	926806	999240	927565	1072434	19	073193	000759
42	926873	999238	927635	1072364	18	973126	000761
43	926940	999235	927704	1072295	17	073059	000764
44	927006	999233	927773	1072226	16	072993	000766
45	927073	999231	927842	1072157	15	072926	000768
46	927139	999228	927911	1072088	14	072860	000771
47	927206	999226	927980	1072019	13	072793	000773
48	927272	999223	928048	1071951	12	072727	000776
49	927338	999221	928117	1071882	11	072661	000778
50	927404	999219	928185	1071814	10	072595	000780
51	927470	999216	928254	1071745	9	072529	000783
52	927536	999214	928322	1071677	8	072463	000785
53	927603	999211	928390	1071609	7	072397	000788
54	927668	999209	928458	1071541	6	072331	000790
55	927733	999206	928526	1071473	5	072266	000793
56	927799	999204	928594	1071405	4	072200	000795
57	927864	999202	928662	1071337	3	072135	000797
58	927929	999199	928730	1071269	2	072070	000800
59	927994	999197	928797	1071202	1	072005	000802
60	928059	999194	928865	1071134	0	071940	000805
	Sine Comple.	Sine	Tangent Comple.	Tang.	79		

	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of Sine.	Com. ar. of Si. co.
0	9280590	9991940	9288650	10711340	60	0719400	0008060
1	9281240	9991920	9289320	10710670	59	0718150	0008070
2	9281890	9991890	9289990	10710000	58	0718750	0008110
3	9282540	9991870	9290670	10709320	57	0717450	0008130
4	9283190	9991840	9291340	10708650	56	0716800	0008160
5	9283830	9991820	9292010	10707980	55	0716160	0008180
6	9284480	9991790	9292680	10707310	54	0715510	0008210
7	9285120	9991770	9293350	10706650	53	0714870	0008230
8	9285760	9991740	9294010	10705980	52	0714230	0008260
9	9286400	9991720	9294680	10705310	51	0713590	0008280
10	9287040	9991690	9295340	10704650	50	0712950	0008310
11	9287680	9991670	9296010	10703980	49	0712310	0008330
12	9288320	9991640	9296670	10703320	48	0711670	0008360
13	9288960	9991620	9297330	10702660	47	0711030	0008380
14	9289600	9991590	9298000	10701990	46	0710390	0008410
15	9290220	9991570	9298660	10701330	45	0709760	0008430
16	9290870	9991540	9299320	10700670	44	0709120	0008460
17	9291500	9991520	9299980	10700010	43	0708490	0008480
18	9292130	9991490	9300630	10699360	42	0707860	0008510
19	9292760	9991470	9301290	10698700	41	0707230	0008530
20	9293390	9991440	9301950	10698040	40	0706600	0008560
21	9294020	9991420	9302600	10697390	39	0705970	0008580
22	9294650	9991390	9303260	10696730	38	0705340	0008610
23	9295280	9991370	9303910	10696080	37	0704710	0008630
24	9295910	9991340	9304560	10695430	36	0704080	0008660
25	9296530	9991320	9305210	10694780	35	0703460	0008680
26	9297160	9991290	9305860	10694130	34	0702830	0008710
27	9297780	9991260	9306510	10693480	33	0702210	0008740
28	9298410	9991240	9307160	10692830	32	0701580	0008760
29	9299030	9991210	9307810	10692180	31	0700960	0008790
30	9299650	9991190	9308460	10691530	30	0700340	0008810
	Sine Comple.	Sine.	Tangent Comple.	Tang.	78		

Sine.	Sine Comple.	Tang.	Tangent Complem.		Com. ar. of sine.	Com. ar. of si. co.
929965	999119	930846	1069153	30	070034	000880
930027	999116	930916	1069089	29	069972	000883
930089	999114	930975	1069024	28	069910	000885
930151	999111	931039	1068960	27	069848	000888
930213	999108	931104	1068895	26	069786	000891
930274	999106	931168	1068831	25	069725	000893
930336	999103	931232	1068767	21	069663	000896
930397	999101	931296	1068703	23	069602	000898
930459	999098	931361	1068639	22	069540	000901
930520	999095	931424	1068575	21	069479	000904
930581	999093	931488	1068511	20	069418	000906
930643	999091	931552	1068447	19	069356	000909
930704	999088	931615	1068384	18	069295	000911
930765	999085	931679	1068320	17	069234	000914
930825	999082	931742	1068257	16	069174	000917
930886	999080	931806	1068193	15	069113	000919
930947	999077	931869	1068130	14	069052	000922
931007	999075	931932	1068067	13	068992	000924
931068	999072	931996	1068003	12	068931	000927
931128	999069	932059	1067947	11	068871	000930
931189	999067	932122	1067877	10	068810	000932
931249	999064	932185	1067814	9	068750	000935
931309	999061	932247	1067752	8	068690	000938
931369	999059	932310	1067689	7	068630	000940
931429	999056	932373	1067626	6	068570	000943
931489	999053	932435	1067564	5	068510	000946
931549	999051	932498	1067501	4	068450	000948
931609	999048	932560	1067439	3	068390	000951
931668	999045	932623	1067376	2	068331	000954
931728	999043	932685	1067314	1	068271	000956
931787	999040	932747	1067252	0	068212	000959
Sine Comple.	Sine.	Tangent Comple.	Tang.	78		

12	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ti.
0	9317787	999040	9327747	10672252	60	068212	00095
1	9318477	999037	9328097	10671902	59	068152	00096
2	9319067	999035	9328711	10671289	58	068093	00096
3	9319657	999032	9329337	10670663	57	068034	00096
4	9320247	999029	9329957	10670043	56	067975	00097
5	9320837	999026	9330577	10669423	55	067916	00097
6	9321427	999024	9331187	10668813	54	067857	00097
7	9322017	999021	9331807	10668193	53	067798	00097
8	9322607	999018	9332417	10667583	52	067739	00098
9	9323197	999016	9333037	10666963	51	067680	00098
10	9323787	999013	9333647	10666353	50	067621	00098
11	9324367	999010	9334257	10665743	49	067563	00098
12	9324957	999007	9334877	10665123	48	067504	00099
13	9325537	999005	9335487	10664513	47	067446	00099
14	9326117	999002	9336097	10663903	46	067388	00099
15	9326697	998999	9336707	10663293	45	067330	00100
16	9327287	998996	9337317	10662683	44	067271	00100
17	9327867	998994	9337917	10662083	43	067213	00100
18	9328447	998991	9338527	10661473	42	067155	00100
19	9329027	998988	9339137	10660863	41	067097	00101
20	9329597	998985	9339737	10660263	40	067040	00101
21	9330177	998983	9340347	10659653	39	066982	00101
22	9330757	998980	9340947	10659053	38	066924	00101
23	9331327	998977	9341557	10658443	37	066867	00102
24	9331907	998974	9342157	10657843	36	066809	00102
25	9332477	998972	9342757	10657243	35	066752	00102
26	9333057	998969	9343357	10656643	34	066694	00103
27	9333627	998966	9343957	10656043	33	066637	00103
28	9334197	998963	9344557	10655443	32	066580	00103
29	9334767	998960	9345137	10654843	31	066523	00103
30	9335337	998958	9345757	10654243	30	066466	00104
	Sine Comple.	Sine.	Tangent Comple.	Tang.	77		

	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of si. co.
0	933533	998958	934575	1065424	30	066466	001041
1	933590	998955	934635	1065364	29	066409	001044
2	933647	998952	934694	1065305	28	066352	001047
3	933704	998949	934754	1065245	27	066295	001050
4	933760	998946	934814	1065185	26	066239	001053
5	933817	998944	934873	1065126	25	066182	001055
6	933874	998941	934932	1065067	24	066125	001058
7	933930	998938	934992	1065007	23	066069	001061
8	933987	998935	935051	1064948	22	066012	001064
9	934043	998932	935110	1064889	21	065956	001067
10	934099	998929	935169	1064830	20	065900	001070
11	934155	998927	935228	1064771	19	065844	001072
12	934211	998924	935287	1064712	18	065788	001075
13	934267	998921	935346	1064653	17	065732	001078
14	934302	998918	935405	1064594	16	065676	001081
15	934379	998915	935464	1064535	15	065620	001084
16	934435	998912	935522	1064477	14	065564	001087
17	934491	998909	935581	1064418	13	065508	001090
18	934546	998907	935639	1064360	12	065453	001092
19	934602	998904	935698	1064301	11	065397	001095
20	934657	998901	935756	1064243	10	065342	001098
21	934713	998898	935814	1064181	9	065286	001101
22	934768	998895	935873	1064126	8	065231	001104
23	934823	998892	935931	1064068	7	065176	001107
24	934879	998889	935989	1064010	6	065120	001112
25	934934	998886	936047	1063952	5	065065	001113
26	934989	998884	936105	1063894	4	065010	001115
27	935044	998881	936163	1063836	3	064955	001118
28	935099	998878	936221	1063779	2	064900	001121
29	935154	998875	936278	1063721	1	064845	001124
30	935208	998872	936336	1063563	0	064791	001127
	Sine Comple.	Sine.	Tangent Comple.	Tang.	77		

13	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
0	935208	998872	936336	1063663	60	064791	001127
1	935263	998869	936394	1063605	59	064736	001130
2	935318	998866	936451	1063548	58	064681	001133
3	935372	998863	936509	1063490	57	064627	001136
4	935427	998860	936566	1063433	56	064572	001139
5	935481	998857	936623	1063376	55	064518	001142
6	935535	998854	936681	1063319	54	064464	001145
7	935590	998851	936738	1063261	53	064409	001148
8	935644	998848	936795	1063204	52	064355	001151
9	935698	998845	936852	1063147	51	064301	001154
10	935752	998843	936909	1063090	50	064247	001156
11	935806	998840	936966	1063033	49	064193	001159
12	935860	998837	937023	1062976	48	064139	001162
13	935914	998834	937079	1062920	47	064085	001165
14	935967	998831	937136	1062863	46	064032	001168
15	936021	998828	937193	1062806	45	063978	001171
16	936075	998825	937249	1062750	44	063924	001174
17	936128	998822	937306	1062693	43	063871	001177
18	936182	998819	937362	1062637	42	063817	001180
19	936235	998816	937419	1062580	41	063764	001183
20	936288	998813	937475	1062524	40	063711	001186
21	936342	998810	937531	1062468	39	063657	001189
22	936395	998807	937588	1062411	38	063604	001192
23	936448	998804	937643	1062355	37	063551	001195
24	936501	998801	937700	1062299	36	063498	001198
25	936554	998798	937756	1062240	35	063445	001201
26	936607	998795	837812	1062187	34	063396	001204
27	936660	998792	937868	1062131	33	063332	001207
28	936713	998789	937923	1062076	32	063289	001210
29	936765	998786	937979	1062020	31	063234	001213
30	936818	998783	938035	1061964	30	063181	001216
	Sine Comple.	Sine.	Tangent Comple.	Tang.	76		

	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. &c.
0	936818	998783	938035	1061964	30	063181	001216
1	936871	998780	938091	1061909	29	063128	001219
2	936923	998777	938146	1061853	28	063076	001222
3	936976	998774	938202	1061797	27	063023	001225
4	937028	998770	938257	1061742	26	062971	001229
5	937080	998767	938312	1061687	25	062919	001232
6	937133	998764	938368	1061631	24	062866	001235
7	937185	998761	938423	1061576	23	062814	001238
8	937237	998758	938478	1061521	22	062762	001241
9	937289	998755	938533	1061466	21	062710	001244
10	937341	998752	938588	1061411	20	062658	001247
11	937393	998749	938643	1061356	19	062606	001250
12	937445	998746	938698	1061301	18	062554	001253
13	937496	998743	938753	1061246	17	062503	001256
14	937548	998740	938808	1061191	16	062451	001259
15	937600	998737	938863	1061136	15	062399	001262
16	937651	998734	938917	1061082	14	062348	001265
17	937703	998731	938972	1061027	13	062296	001268
18	937754	998727	939027	1060973	12	062245	001272
19	937806	998724	939081	1060918	11	062193	001275
20	937857	998721	939135	1060864	10	062142	001278
21	937908	998718	939190	1060809	9	062091	001281
22	937960	998715	939244	1060755	8	062039	001284
23	938011	998712	939298	1060701	7	061988	001287
24	938062	998709	939355	1060644	6	061937	001290
25	938113	998706	939407	1060592	5	061886	001293
26	938164	998702	939461	1060538	4	061835	001297
27	938215	998699	939515	1060484	3	061784	001300
28	938266	998696	939569	1060430	2	061733	001303
29	938316	998693	939623	1060376	1	061683	001305
30	938367	998690	939677	1060322	0	061632	001309
	Sine Comple.	Sine.	Tangent Comple.	Tang.	76		

14	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ax. of sine.	Com. ax. of si. co.
0	938367	998690	939673	1060322	60	061632	001309
1	938418	998687	939730	1060269	59	061581	001312
2	938468	998684	939784	1060215	58	061531	001315
3	938519	998680	939838	1060161	57	061480	001319
4	938569	998677	939891	1060108	56	061430	001322
5	938620	998674	939945	1060054	55	061379	001325
6	938670	998671	939998	1060001	54	061329	001328
7	938720	998668	940052	1059947	53	061279	001331
8	938770	998665	940105	1059894	52	061229	001334
9	938821	998661	940159	1059840	51	061178	001338
10	938871	998658	940212	1059787	50	061128	001341
11	938921	998655	940265	1059734	49	061078	001344
12	938971	998652	940318	1059681	48	061028	001347
13	939020	998649	940371	1059628	47	060979	001350
14	939070	998645	940424	1059575	46	060929	001354
15	939120	998642	940477	1059522	45	060879	001357
16	939170	998639	940530	1059469	44	060829	001360
17	939219	998636	940583	1059416	43	060780	001363
18	939269	998633	940636	1059363	42	060730	001366
19	939319	998629	940689	1059310	41	060680	001370
20	939368	998626	940741	1059258	40	060631	001373
21	939417	998623	940794	1059205	39	060582	001376
22	939467	998620	940847	1059152	38	060532	001379
23	939516	998616	940899	1059100	37	060483	001383
24	939565	998613	940952	1059047	36	060434	001386
25	939614	998610	941004	1058995	35	060385	001389
26	939664	998607	941056	1058943	34	060335	001392
27	939713	998603	941109	1058890	33	060286	001396
28	939762	998600	941161	1058838	32	060237	001399
29	939811	998597	941213	1058786	31	060188	001402
30	939859	998594	941265	1058734	30	060140	001405
	Sine Comple.	Sine.	Tangent Comple.	Tang.	75		

Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
939859	998594	941265	1058734	30	060140	001405
939908	998590	941317	1058682	29	060091	001409
939957	998587	941369	1058630	28	060042	001412
940006	998584	941421	1058578	27	059993	001415
940054	998581	941473	1058526	26	059945	001418
940103	998577	941525	1058474	25	059896	001422
940152	998574	941577	1058422	24	059847	001425
940200	998571	941629	1058370	23	059799	001428
940248	998567	941680	1058319	22	059751	001432
940297	998564	941732	1058267	21	059702	001435
940345	996561	941784	1058215	20	059654	001438
940393	998557	941835	1058164	19	059606	001442
940441	998554	941887	1058112	18	059558	001445
940490	998551	941938	1058061	17	059509	001448
940538	998548	941990	1058009	16	059461	001451
940586	998544	942041	1057958	15	059413	001455
940634	998541	942092	1057907	14	049365	001458
940682	998538	942143	1057856	13	059317	001461
940729	998534	942195	1057804	12	059270	001465
940777	998531	942246	1057753	11	059222	001468
940825	998528	942297	1057702	10	059174	001471
940873	998524	942348	1057561	9	059126	001475
940920	998521	942399	1057600	8	059079	001478
940968	998517	942450	1057549	7	059031	001482
941015	998514	942501	1057498	6	058984	001485
941063	998511	942551	1057448	5	058936	001488
941110	998507	942602	1057397	4	058889	001492
941157	998504	942653	1052346	3	058842	001495
941205	998501	942704	1057295	2	058794	001498
941252	998497	942754	1057245	1	058747	001502
941299	998494	942805	1057194	0	058700	001505
Sine Comple.	Sine.	Tangent Comple.	Tang.	75		

15	Sine.	Sine Comple.	Tang	Tangent complem.		Com. ar. of sine	Com. of s.
0	941299	998494	942805	1057194	60	058700	001
1	941346	998490	942855	1057144	59	058653	001
2	941393	998487	942906	1057093	58	058606	001
3	941440	998484	942956	1057043	57	058559	001
4	941487	998480	943006	1056993	56	058512	001
5	941534	998477	943057	1056942	55	058465	001
6	941581	998474	943107	1056892	54	058418	001
7	942628	998470	943157	1056842	53	058371	001
8	941675	998467	943207	1056792	52	058324	001
9	941721	998463	943257	1056742	51	058278	001
10	941768	998460	943308	1056691	50	058231	001
11	941814	998456	943358	1056641	49	058185	001
12	941861	998453	943408	1056592	48	058138	001
13	941907	998450	943457	1056542	47	058092	001
14	941954	998446	943507	1056492	46	058045	001
15	942000	998443	943557	1056442	45	057999	001
16	942047	998439	943607	1056392	44	057952	001
17	942093	998436	943657	1056342	43	057906	001
18	942139	998432	943706	1056293	42	057861	001
19	942185	998429	943756	1056243	41	057814	001
20	942231	998425	943805	1056194	40	057768	001
21	942277	998422	943855	1056144	39	057722	001
22	942323	998418	943904	1056095	38	057676	001
23	942369	998415	943954	1056045	37	057630	001
24	942415	998412	944003	1055996	36	057584	001
25	942461	998408	944052	1055947	35	057538	001
26	942507	998405	944102	1055897	34	057492	001
27	942552	998401	944151	1055848	33	057447	001
28	942598	998398	944200	1055799	32	057301	001
29	942644	998384	944249	1055750	31	057355	001
30	942689	998391	944298	1055701	30	057310	001
	Sine Comple.	Sine.	Tangent Comple.	Tang.	74		

Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of fine.	Com. ar. of ſi. co.
942689	998391	944298	1055701	30	057310	001608
942735	998387	944347	1055652	29	057264	001612
942780	998384	944396	1055603	28	057219	001615
942826	998380	944445	1055554	27	057173	001619
942871	998377	944494	1055505	26	057128	001622
942917	998373	944543	1055456	25	057081	001626
942962	998369	944592	1055407	24	057037	001630
943007	998366	944641	1055358	23	056991	001633
943052	998362	944689	1055310	22	056947	001637
943097	998359	944738	1055261	21	056901	001640
943142	998355	944787	1055212	20	056857	001644
943187	998352	944835	1055164	19	056812	001647
943232	998348	944884	1055115	18	056767	001651
943277	998345	944932	1055067	17	056722	001654
943322	998341	944981	1055018	16	056677	001658
943367	998338	945029	1054970	15	056632	001661
943412	998334	945077	1054922	14	056587	001665
943456	998330	945126	1054873	13	056543	001669
943501	998327	945174	1054825	12	556498	001672
943546	998323	945222	1054777	11	056453	001676
943590	998320	945270	1054729	10	056409	001679
943635	998316	945318	1054681	9	056364	001683
943679	998313	945366	1054633	8	056320	001686
943724	998309	945414	1054585	7	056275	001690
943768	998305	945462	1054537	6	056231	001694
943812	998302	945510	1054489	5	056187	001697
943857	998298	945558	1054441	4	056142	001701
943901	998295	943606	1054393	3	056098	001704
943945	998291	945654	1054345	2	056054	001708
943989	998287	945701	1054298	1	056010	001712
944033	998284	945749	1054250	0	055966	001715
Sine Comple.	Sine.	Tangent Comple.	Tang.	74		

16	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. of s.
0	944033	998284	945749	1054250	60	055968	001
1	944077	998280	945797	1054202	59	055922	001
2	944121	998276	945844	1054155	58	055878	001
3	944165	998273	945892	1054107	57	055834	001
4	944209	998269	945940	1054059	56	055790	001
5	944253	998266	945987	1054012	55	055746	001
6	944297	998262	946034	1053965	54	055702	001
7	944341	998258	946082	1053917	53	055658	001
8	944384	998255	946129	1053870	52	055615	001
9	944428	998251	946176	1053823	51	055571	001
10	944471	998247	946224	1053775	50	055528	001
11	944515	998244	946271	1053728	49	055484	001
12	944559	998240	946318	1053681	48	055440	001
13	944602	998236	946365	1053634	47	055397	001
14	944645	998233	946412	1053587	46	055354	001
15	944689	998229	946459	1053540	45	055310	001
16	944732	998225	946506	1053493	44	055267	001
17	944775	998222	946553	1053446	43	055224	001
18	944819	998218	946600	1053399	42	055180	001
19	944862	998214	946647	1053352	41	055137	001
20	944905	998210	946694	1053305	40	055094	001
21	944948	998207	946741	1053258	35	055051	001
22	944991	998203	946788	1053211	38	055008	001
23	945034	998199	946834	1053165	37	054965	001
24	945077	998196	946881	1053118	36	054912	001
25	945120	998192	946928	1053071	35	054879	001
26	945163	998188	946974	1053525	34	054836	001
27	945206	998184	947021	1052978	33	054793	001
28	945248	998181	947067	1052932	32	054751	001
29	945291	998177	947114	1052885	31	054708	001
30	945334	998173	947160	1052839	30	054665	001
	Sine Comple.	Sine.	Tangent Comple.	Tang.	73		

Sine.	Sine Comple	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of si, co.
945334	998173	947160	10526839	30	054665	001826
945376	998169	947206	10526793	29	054623	001830
945419	998166	947253	10526746	28	054580	001833
945461	998162	947299	10526700	27	054538	001837
945504	998158	947345	10526654	26	054495	001841
945546	998154	947391	10526608	25	054453	001845
945589	998151	947438	10526561	24	054410	001848
945631	998147	947484	10526515	23	054368	001852
945673	998143	947530	10526469	22	054326	001856
945716	998139	947576	10526423	21	054283	001860
945758	998136	947622	10526377	20	054241	001863
945800	998132	947668	10526331	19	054199	001867
945842	998128	947714	10526285	18	054157	001871
945884	998124	947760	10526239	17	054115	001875
945926	998120	947805	10526194	16	054073	001879
945968	998117	947850	10526148	15	054031	001882
946010	998113	947897	10526102	14	053989	001886
946052	998109	947943	10526056	13	053947	001890
946094	998105	947988	10526011	12	053905	001894
946136	998101	948034	10525965	11	053863	001898
946178	998098	948080	10525919	10	053821	001901
946219	998094	948125	10525874	9	053780	001905
946261	998090	948171	10525828	8	053738	001909
946303	998086	948216	10525783	7	053696	001913
946344	998082	948262	10525737	6	053655	001917
946386	998078	948307	10525692	5	053613	001921
946427	998075	948352	10525647	4	053572	001924
946469	998071	948396	10525601	3	053530	001928
946510	998067	948443	10525556	2	053489	001932
946552	998063	948488	10525511	1	053447	001936
946593	998059	948533	10525466	0	053406	001940
Sine Comple.	Sine.	Tangent Comple.	Tang.	73		

17	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sint.	Com. ar. of si. co.
0	946593	998059	948533	1051466	60	053406	001940
1	946634	998055	948579	1051420	59	053365	001944
2	946676	998051	948624	1051373	58	053323	001948
3	946717	998048	948669	1051330	57	053282	001951
4	946758	998044	948714	1051285	56	053241	001955
5	946799	998040	948759	1051240	55	053200	001959
6	946840	998036	948804	1051195	54	053159	001963
7	946881	998032	948849	1051150	53	053118	001967
8	946922	998028	948894	1051105	52	053077	001971
9	946963	998024	948938	1051061	51	053036	001975
10	947004	998020	948983	1051016	50	054996	001979
11	947045	998016	949028	1050971	49	052954	001983
12	947086	998012	949073	1050926	48	052913	001987
13	947127	998009	949118	1050881	47	052872	001990
14	947167	998005	949162	1050837	46	052832	001994
15	947208	998001	949207	1050792	45	052791	001998
16	947249	997997	949251	1050748	44	052750	002001
17	947289	997993	949296	1050703	43	052710	002006
18	947330	997989	949340	1050659	42	052669	002010
19	947370	997985	949385	1050614	41	052627	002014
20	947411	997981	949429	1050570	40	052588	002018
21	947451	997977	949474	1050525	39	052548	002021
22	947492	997973	949518	1050481	38	052507	002026
23	947532	997969	949562	1050437	37	052467	002030
24	947573	997965	949607	1050392	36	052426	002034
25	947613	997961	949651	1050348	35	052386	002038
26	947653	997957	949695	1050304	34	052346	002042
27	947693	997953	949739	1050260	33	052306	002046
28	947733	997949	949784	1050215	32	052266	002050
29	947774	997945	949828	1050171	31	052225	002054
30	947814	997941	949872	1050127	30	052185	002058
	Sine Comple.	Sine.	Tangent Comple.	Tang.	72		

17	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ti. co.
30	947814	997941	949872	1050127	30	052185	002058
31	947854	997937	949916	1050083	29	052145	002062
32	947894	997933	949960	1050039	28	052105	002066
33	947934	997929	950004	1049995	27	052065	002070
34	947974	997925	950048	1049951	26	052025	002074
35	948014	997921	950092	1049907	25	051985	002078
36	948053	997917	950135	1049864	24	051946	002082
37	948093	997913	950179	1049829	23	051906	002086
38	948133	997909	950223	1049776	22	051866	002090
39	948173	997905	950267	1049732	21	051826	002094
40	948212	997901	950310	1049689	20	051787	002098
41	948252	997897	950354	1049645	19	051747	002102
42	948292	997893	950398	1049601	18	051707	002106
43	948331	997889	950441	1049558	17	051668	002110
44	948371	997885	950485	1049514	16	051628	002114
45	948410	997881	950528	1049471	15	051589	002118
46	948450	997877	950572	1049427	14	051549	002122
47	948489	997873	950615	1049384	13	051510	002126
48	948528	997869	950659	1049340	12	051471	002130
49	948568	997865	950702	1049297	11	051431	002134
50	948607	997861	950746	1049253	10	051392	002138
51	948646	997857	950789	1049210	9	051353	002142
52	948685	997853	950832	1049167	8	051314	002146
53	948725	997849	950875	1049124	7	051274	002150
54	948764	997845	950919	1049080	6	051235	002154
55	948803	997841	950962	1049037	5	051196	002158
56	948842	997837	951005	1048994	4	051157	002162
57	948881	997832	951048	1048951	3	051118	002167
58	948920	997828	951091	1048908	2	051079	002171
59	948959	997824	951134	1048865	1	051040	002175
60	948998	997820	951177	1048822	0	051001	002179
	Sine Comple.	Sine.	Tangent Comple.	Tang.	72		

18	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of si. co.
0	948998	997820	951177	1048822	60	051001	002178
1	949037	997816	951220	1048779	59	050962	002183
2	949075	997812	951263	1048736	58	050924	002187
3	949114	997808	951306	1048693	57	050885	002191
4	949153	997804	951349	1048650	56	050846	002195
5	949192	997800	951392	1048607	55	050807	002199
6	949230	997795	951434	1048565	54	050769	002204
7	949269	997791	951477	1048522	53	050730	002208
8	949308	997787	951520	1048479	52	050691	002212
9	949346	997783	951563	1048436	51	050653	002216
10	949385	997779	951605	1048394	50	050614	002220
11	949423	997775	951648	1048351	49	050576	002224
12	949462	997771	951690	1048309	48	050537	002228
13	949500	997766	951733	1048266	47	050499	002233
14	949538	997762	951776	1048223	46	050461	002237
15	949577	997758	951818	1048181	45	050422	002241
16	949615	997754	951861	1048138	44	050384	002245
17	949653	997750	951903	1048096	43	050346	002249
18	949691	997746	951945	1048054	42	050308	002253
19	949730	997741	951988	1048011	41	050269	002258
20	949768	997737	952030	1047969	40	050231	002262
21	949806	997733	952072	1047927	39	050193	002266
22	949844	997729	952115	1047884	38	050155	002270
23	949882	997725	952157	1047842	37	050117	002274
24	949920	997720	952199	1047800	36	050079	002279
25	949958	997716	952241	1047758	35	050041	002283
26	949996	997712	952283	1047716	34	050003	002287
27	950034	997708	952325	1047674	33	049965	002291
28	950072	997704	952367	1047632	32	049927	002295
29	950109	997699	952409	1047590	31	049890	002300
30	050147	997695	952451	1047548	30	049852	002304
	Sine Comple.	Sine.	Tangent Comple.	Tang.	71		

18	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of si. co.
30	950147	997695	952451	1047548	30	049852	002304
31	950185	997691	952493	1047506	29	049814	002308
32	950223	997687	952535	1047464	28	049776	002312
33	950260	997682	952577	1047422	27	049739	002317
34	950298	997678	952619	1047380	26	049701	002321
35	950335	997674	952661	1047338	25	049664	002325
36	950373	997670	952703	1047296	24	049626	002329
37	950411	997665	952745	1047254	23	049588	002334
38	950448	997661	952786	1047213	22	049551	002338
39	950485	997657	952828	1047171	21	049514	002342
40	950523	997653	952870	1047129	20	049476	002346
41	950560	997648	952911	1047088	19	049439	002351
42	950598	997644	952953	1047046	18	049401	002355
43	950635	997640	952995	1047004	17	049364	002359
44	950672	997636	953036	1046963	16	049327	002363
45	950709	997631	953078	1046921	15	049290	002368
46	950747	997627	953119	1046880	14	049252	002372
47	950784	997623	953161	1046838	13	049215	002376
48	950821	997618	953202	1046797	12	049178	002381
49	950858	997614	953243	1046756	11	049141	002385
50	950895	997610	953285	1046714	10	049104	002389
51	950932	997605	953326	1046673	9	049067	002394
52	950969	997607	953367	1046632	8	049030	002398
53	951006	997597	953409	1046590	7	048993	002402
54	951043	997593	953450	1046549	6	048956	002406
55	951080	997588	953491	1046508	5	048919	002411
56	951117	997584	953532	1046467	4	048882	002415
57	951153	997580	953573	1046426	3	048846	002419
58	951190	997575	953615	1046384	2	048809	002424
59	951227	997571	953656	1046343	1	048772	002428
60	951264	997567	953697	1046302	0	048735	002432
	Sine Comple.	Sine.	Tangent Comple.	Tang.	71		

19	Sine	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
0	951264	997567	953697	1046302	60	048735	002432
1	951300	997562	953738	1046261	59	048699	002437
2	951337	997558	953779	1046220	58	048662	002441
3	951374	997553	953820	1046179	57	048625	002446
4	951410	997549	953861	1046138	56	048589	002450
5	951447	997545	953902	1046098	55	048552	002454
6	951483	997540	953942	1046057	54	048516	002459
7	951520	997536	953983	1046016	53	048479	002463
8	951556	997532	954024	1045975	52	048443	002467
9	951593	997527	954065	1045934	51	048407	002472
10	951620	997522	954106	1045893	50	048370	002476
11	951665	997518	954146	1045853	49	048334	002481
12	951701	997514	954187	1045812	48	048298	002485
13	951738	997510	954228	1045771	47	048261	002489
14	951774	997505	954268	1045731	46	048225	002494
15	951810	997501	954309	1045690	45	048189	002498
16	951846	997496	954349	1045650	44	048153	002503
17	951882	997492	954390	1045609	43	048117	002507
18	951919	997488	954431	1045569	42	048080	002511
19	951955	997483	954471	1045528	41	048044	002516
20	951991	997479	954511	1045488	40	048008	002520
21	952027	997474	954552	1045447	39	047972	002525
22	952063	997470	954592	1045407	38	047936	002529
23	952098	997465	954633	1045366	37	047907	002534
24	952134	997461	954673	1045326	36	047865	002538
25	952170	997456	954713	1045286	35	047829	002543
26	952206	997452	954754	1045245	34	047793	002547
27	952242	997448	954794	1045205	33	047757	002551
28	952278	997443	954834	1045165	32	047721	002556
29	952313	997439	954874	1045125	31	047686	002560
30	952349	997434	954914	1045085	30	047650	002565
	Sine Comple.	Sine	Tangent Comple.	Tang.	70		

15	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of si. co.
30	952349	997434	954914	1045085	30	047650	002565
31	952385	997430	954955	1045045	29	047614	002569
32	952420	997425	954995	1045004	28	047579	002574
33	952456	997421	955035	1044964	27	047543	002578
34	952491	997416	955075	1044924	26	047508	002583
35	952527	997412	955115	1044884	25	047472	002587
36	952562	997407	955155	1044844	24	047437	002592
37	952598	997403	955195	1044804	23	047401	002596
38	952633	997398	955235	1044764	22	047366	002601
39	952669	997394	955275	1044724	21	047330	002605
40	952704	997389	955314	1044685	20	047295	002610
41	952739	997385	955354	1044645	19	047260	002614
42	952775	997380	955394	1044605	18	047224	002619
43	952810	997376	955434	1044563	17	047189	002624
44	952845	997371	955474	1044525	16	047154	002628
45	952880	997367	955513	1044486	15	047119	002632
46	952916	997362	955553	1044446	14	047083	002637
47	952951	997358	955593	1044406	13	047048	002641
48	952986	997353	955632	1044367	12	047013	002646
49	953021	997348	955672	1044327	11	046978	002651
50	953056	997344	955712	1044287	10	046943	002655
51	953091	997339	955751	1044248	9	046908	002660
52	953126	997335	955791	1044208	8	046873	002664
53	953161	997330	955830	1044169	7	046838	002669
54	953196	997326	955870	1044129	6	046803	002673
55	953231	997321	955909	1044090	5	046768	002678
56	953266	997316	955949	1044050	4	046738	002683
57	953300	997312	955988	1044011	3	046699	002687
58	953335	997307	956027	1043972	2	046664	002692
59	953376	997303	956067	1043932	1	046629	002696
60	953405	997298	956106	1043891	0	046594	002701
	Sine Comple.	Sine	Tangent Comple.	Tang.	70		

20	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of si. co.
0	953405	997298	956106	1043893	60	046594	002701
1	953439	997293	956145	1043854	59	046560	002706
2	953474	997289	956185	1043814	58	046525	002710
3	953509	997284	956224	1043775	57	046490	002715
4	953543	997280	956263	1043736	56	046456	002719
5	953578	997275	956302	1043697	55	046421	002724
6	953612	997270	956341	1043658	54	046387	002729
7	953647	997266	956381	1043618	53	046352	002755
8	953681	997261	956420	1043579	52	046318	002238
9	953716	997257	956459	1043540	51	046283	002742
10	953750	997252	956498	1043501	50	046249	002747
11	953785	997247	956537	1043462	49	046214	002752
12	953819	997243	956576	1043423	48	046180	002756
13	953853	997238	956615	1043384	47	046146	002761
14	953888	997233	956654	1043345	46	046111	002766
15	953922	997229	956693	1043306	45	046077	002770
16	953956	997224	956732	1043267	44	046043	002775
17	953990	997219	956770	1043229	43	046009	002780
18	954024	997215	956809	1043190	42	045975	002784
19	954059	997210	956848	1043151	41	045940	002789
20	954093	997205	956887	1043112	40	045906	002794
21	954127	997201	956926	1043073	39	045872	002798
22	954161	997196	956964	1043035	38	045838	002803
23	954195	997191	957003	1042996	37	045804	002808
24	954229	997187	957042	1042957	36	045770	002812
25	954263	997182	957080	1042919	35	045736	002817
26	954297	997177	957119	1042880	34	045702	002822
27	954331	997172	957158	1042841	33	045668	002827
28	954364	997168	957196	1042803	32	045635	002831
29	954398	997163	957235	1042764	31	045601	002836
30	954432	997158	957273	1042726	30	045567	002841
	Sine Comple.	Sine.	Tangent Complem.	Tang.	69		

20	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine	Com. ar. of ſi. co.
30	954432	997158	957273	1042726	30	045567	002841
31	954466	997154	957312	1042687	29	045533	002845
32	954500	997149	957350	1042649	28	045499	002850
33	954533	997144	957389	1042610	27	045466	002855
34	954567	997139	957427	1042572	26	045432	002860
35	954601	997135	957466	1042533	25	045398	002864
36	954634	997130	957504	1042495	24	045365	002869
37	954668	997125	957542	1042457	23	045331	002874
38	954701	997120	957581	1042418	22	045298	002879
39	954735	997116	957619	1042380	21	045264	002883
40	954768	997111	957657	1042342	20	045231	002888
41	954802	997106	957695	1042304	19	045197	002893
42	954835	997101	957734	1042265	18	045164	002898
43	954869	997097	957772	1042227	17	045130	002902
44	954902	997092	957810	1042189	16	045097	002907
45	954936	997087	957848	1042151	15	045063	002912
46	954969	997082	957886	1042113	14	045030	002917
47	955002	997077	957924	1042075	13	044997	002922
48	955035	997073	957962	1042037	12	044964	002926
49	955069	997068	958000	1041999	11	044930	002931
50	955102	997063	958038	1041961	10	044897	002936
51	955135	997058	958076	1041923	9	044864	002941
52	955168	997053	958114	1041885	8	044831	002946
53	955201	997049	958152	1041847	7	044798	002950
54	955234	997044	958190	1041809	6	044765	002955
55	955268	997039	958228	1041771	5	044731	002960
56	955301	997034	958266	1041733	4	044698	002965
57	955334	997029	958304	1041695	3	044665	002970
58	955367	997024	958342	1041657	2	044632	002975
59	955399	997020	958379	1041620	1	044600	002979
60	955432	997015	958417	1041582	0	044567	002984
	Sine Comple.	Sine.	Tangent Comple.	Tang.	69		

21	Sine.	Sine Comple	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of si. co.
0	955434	997015	958417	1041582	60	044567	002984
1	955465	997010	958455	1041544	59	044534	002989
2	955498	997005	958493	1041506	58	044501	002994
3	955531	997000	958530	1041469	57	044468	002999
4	955564	996995	958568	1041431	56	044435	003004
5	955597	996990	958606	1041393	55	044402	003009
6	955629	996986	958643	1041356	54	044370	003014
7	955662	996981	958681	1041318	53	044337	003018
8	955695	996976	958719	1041280	52	044304	003023
9	955727	996971	958756	1041243	51	044272	003028
10	955760	996966	958794	1041205	50	044230	003033
11	955793	996961	958831	1041168	49	044206	003038
12	955825	996956	958869	1041130	48	044174	003043
13	955858	996951	958906	1041093	47	044141	003048
14	955890	996946	958944	1041055	46	044109	003053
15	955923	996941	958981	1041018	45	044076	003058
16	955955	996937	959018	1040981	44	044044	003062
17	955988	996932	959056	1040943	43	044011	003067
18	956020	996927	959093	1040906	42	043979	003072
19	956053	996922	959130	1040869	41	043946	003077
20	956085	996917	959168	1040831	40	043914	003082
21	956117	996912	959205	1040795	39	043882	003087
22	956150	996907	959242	1040757	38	043849	003092
23	956182	996902	959279	1040720	37	043817	003097
24	956214	996897	959317	1040682	36	043785	003102
25	956246	996892	959354	1040645	35	043753	003107
26	956279	996887	959391	1040608	34	043720	003112
27	956311	996882	959428	1040571	33	043688	003117
28	956343	996877	959465	1040534	32	043656	003122
29	956375	996872	959502	1040497	31	043624	003127
30	956407	996867	959539	1040460	30	043592	003132
	Sine Comple	Sine.	Tangent Comple.	Tang.	68		

21	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of si. co.
30	956402	996867	959539	1040460	30	043592	003132
31	956439	996862	959576	1040423	29	043560	003137
32	956471	996857	959613	1040386	28	043528	003142
33	956503	996852	959650	1040349	27	043496	003147
34	956535	996847	959687	1040312	26	043464	003152
35	956567	996842	959724	1040275	25	043432	003157
36	956599	996837	959761	1040238	24	043400	003162
37	956631	996832	959798	1040201	23	043368	003167
38	956663	996827	959835	1040164	22	043336	003172
39	956695	996822	959872	1040127	21	043304	003177
40	956726	996817	959909	1040090	20	043273	003182
41	956758	996812	959945	1040054	19	043241	003187
42	956790	996807	959982	1040017	18	043209	003192
43	956822	996802	960019	1039980	17	043177	003197
44	956853	996797	960056	1039943	16	043146	003202
45	956885	996792	960092	1039907	15	043114	003207
46	956917	996787	960129	1039870	14	043082	003212
47	956948	996782	960166	1039833	13	043051	003217
48	956980	996777	960202	1039797	12	043019	003222
49	957012	996772	960239	1039760	11	042988	003227
50	957043	996767	960276	1039723	10	042956	003232
51	957075	996762	960312	1039687	9	042924	003237
52	957106	996757	960349	1039650	8	042893	003242
53	957138	996752	960385	1039614	7	042861	003247
54	957169	996747	960422	1039577	6	042830	003252
55	957200	996742	960458	1039541	5	042799	003257
56	957232	996736	960495	1039504	4	042767	003263
57	957263	996731	960531	1039468	3	042736	003268
58	957294	996726	960568	1039431	2	042705	003273
59	957326	996721	960604	1039395	1	042673	003278
60	957357	996716	960640	1039359	0	042642	003283
	Sine Comple.	Sine.	Tangent Comple.	Tang.	68		

22	Sine	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
0	957357	996716	960640	1039359	60	042642	003283
1	957388	996711	960677	1039322	59	042611	003288
2	957420	996706	960713	1039286	58	942579	003293
3	957451	996701	960749	1039250	57	042548	003298
4	957482	996696	960786	1039213	56	042517	003303
5	957513	996691	960822	1039177	55	942486	003308
6	957544	996685	960858	1039141	54	042455	003314
7	957575	996680	960895	1039104	53	042424	003319
8	957606	996675	960931	1039068	52	042393	003324
9	957637	996670	960967	1039032	51	042362	003329
10	957668	996665	961003	1038996	50	042331	003334
11	957699	996660	961039	1038960	49	042300	003339
12	957730	996655	961075	1038924	48	042269	003344
13	957761	996649	961111	1038888	47	042238	003350
14	957792	996644	961148	1038851	46	042207	003355
15	957823	996639	961184	1038815	45	042176	003360
16	957854	996634	961220	1038779	44	042145	003365
17	957885	996629	961256	1038743	43	042114	003370
18	957916	996624	961292	1038707	42	042083	003375
19	957946	996618	961328	1038671	41	042053	003381
20	957977	996613	961364	1038635	40	042022	003386
21	958008	996608	961400	1038600	39	041991	003391
22	958035	996603	961435	1038564	38	041960	003396
23	958069	996598	961471	1038528	37	041930	003401
24	958100	996592	961507	1038492	36	041899	003407
25	958131	996587	961543	1038456	35	041868	003412
26	958161	996582	961579	1038420	34	041838	003417
27	958192	996577	961615	1038384	33	041807	003422
28	958222	996571	961650	1038349	32	041777	003428
29	958253	996566	661686	1038313	31	041746	003433
30	958283	996561	961722	1039277	30	041716	003438
	Sine Comple.	Sine	Tangent Comple.	Tang.	67		

	Sine.	Sine Comple.	Tang	Tangent Complim.		Com. ar. of sine	Com. ar. of ſi. co.
0	958283	996561	961722	1038277	30	041716	003438
1	958314	996556	961758	1038241	29	041685	003443
2	958344	996551	961793	1038206	28	041655	003448
3	958375	996545	961829	1038170	27	041624	003454
4	958405	996540	961865	1038134	26	041594	003459
5	958436	996535	961900	1038099	25	041563	003464
6	958466	996530	961936	1038063	24	041533	003469
7	958496	996524	961972	1038027	23	041503	003475
8	958527	996519	962007	1037992	22	041472	003480
9	958557	996514	962043	1037956	21	041442	003485
10	958587	996508	962078	1037921	20	041412	003491
11	958617	996503	962114	1037885	19	041382	003496
12	958648	996498	962149	1037850	18	041351	003501
13	958678	996493	962185	1037814	17	041321	003506
14	958708	996487	962220	1037779	16	041291	003512
15	958738	996482	962256	1037743	15	041261	003517
16	958768	996477	962291	1037708	14	041231	003522
17	958798	996471	962326	1037673	13	041201	003528
18	958828	996466	962362	1037637	12	041171	003533
19	958858	996461	962397	1037602	11	041141	003538
20	958888	996456	962432	1037567	10	041111	003543
21	958918	996450	962468	1037531	9	041081	003549
22	958948	996445	962503	1037496	8	041051	003554
23	958978	996440	962538	1037461	7	041021	003559
24	959008	996434	962574	1037425	6	040991	003565
25	959038	996429	962609	1037390	5	040961	003570
26	959068	996424	962644	1037355	4	040931	003575
27	959098	996418	962679	1037320	3	040901	003581
28	959128	996413	962714	1037285	2	040871	003586
29	959158	996407	962750	1037249	1	040841	003592
30	959187	996402	962785	1037214	0	040812	003597
	Sine Comple.	Sine.	Tangent Comple.	Tang.	67		

23	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi.
0	959187	996402	962785	1037214	60	040812	00359
1	959217	996397	962820	1037179	59	040782	00360
2	959247	996391	962855	1037144	58	040752	00360
3	959276	996386	962890	1037109	57	040723	00361
4	959306	996381	962925	1037074	56	040693	00361
5	959336	996375	962960	1037039	55	040663	00362
6	959365	996370	962995	1037004	54	040634	00362
7	959395	996364	963030	1036969	53	040604	00363
8	959425	996359	963065	1036934	52	040674	00364
9	959454	996354	963100	1036899	51	040545	00364
10	959484	996348	963135	1036864	50	040515	00365
11	959513	996343	963170	1036829	49	040486	00365
12	959543	996337	963205	1036794	48	040456	00366
13	959572	996332	963240	1036759	47	040427	00366
14	959602	996327	963275	1036724	46	040397	00367
15	959631	996321	963309	1036690	45	040368	00367
16	959660	996316	963344	1036655	44	040339	00368
17	959690	996310	963379	1036620	43	040309	00368
18	959719	996305	963414	1036585	42	040280	00369
19	959748	996299	963449	1036550	41	040251	00370
20	959778	996294	963483	1036516	40	040221	00370
21	959807	996289	963518	1036481	39	040192	00371
22	959836	996283	963553	1036446	38	040163	00371
23	9 9866	996278	963587	1036412	37	040133	00372
24	959895	996272	963622	1036377	36	040104	00372
25	959924	996267	963657	1036342	35	040075	00373
26	959953	996261	963691	1036308	34	040046	00373
27	959982	996256	963726	1036273	33	040017	00374
28	960011	996250	963761	1036238	32	049988	00374
29	960040	996245	963795	1036204	31	049959	00375
30	960069	996239	963830	1036169	30	049930	00376
	Sine Comple.	Sine.	Tangent Comple.	Tang.	66		

23	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
30	960069	996239	963830	1036169	30	039930	003700
31	960099	996234	963864	1036135	29	039900	003765
32	960128	996228	963899	1036100	28	039871	003771
33	960157	996223	963933	1036066	27	039842	003776
34	960186	996217	963968	1036031	26	039814	003782
35	960214	996212	964002	1035997	25	039785	003787
36	960243	996206	964037	1035962	24	039759	003793
37	960272	996201	964071	1035928	23	039727	003798
38	960301	996195	964105	1035894	22	039698	003804
39	960330	996190	964140	1035859	21	039669	003809
40	960359	996184	964174	1035825	20	039640	003815
41	960388	996179	964209	1035790	19	039611	003820
42	960416	996173	964243	1035756	18	039583	003826
43	960445	996168	964277	1035722	17	039554	003832
44	960474	996162	964312	1035687	16	039525	003837
45	960503	996156	964346	1035653	15	039496	003843
46	960531	996151	964380	1035619	14	039468	003848
47	960560	996145	964414	1035585	13	039439	003854
48	960589	996140	964449	1035550	12	039410	003859
49	960617	996134	964483	1035516	11	039382	003865
50	960646	996129	964517	1035482	10	039353	003870
51	960675	996123	964551	1035448	9	039324	003876
52	960703	996117	964585	1035414	8	039296	003882
53	960732	996112	964619	1035380	7	039267	003887
54	960760	996106	964654	1035346	6	039239	003893
55	960789	996101	964688	1035311	5	039210	003898
56	960817	996095	964722	1035277	4	039182	003904
57	960846	996089	964756	1035243	3	039153	003910
58	960874	996084	964790	1035200	2	039125	003915
59	960902	996078	964824	1035175	1	039097	003921
60	960931	996073	964858	1035141	0	039068	003926
	Sine Comple.	Sine.	Tangent Comple.	Tang.	66		

24	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of si. co.
0	9609311	9960732	9648581	10351419	60	0390689	0039268
1	9609599	9960671	9648921	10351079	59	0390401	0039329
2	9609887	9960610	9649261	10350739	58	0390113	0039390
3	9610175	9960549	9649601	10350399	57	0389825	0039451
4	9610462	9960488	9649941	10350059	56	0389538	0039512
5	9610750	9960427	9650281	10349719	55	0389250	0039573
6	9611037	9960366	9650621	10349379	54	0388963	0039634
7	9611324	9960305	9650960	10349040	53	0388676	0039695
8	9611611	9960244	9651300	10348700	52	0388389	0039756
9	9611898	9960183	9651639	10348361	51	0388102	0039817
10	9612185	9960122	9651979	10348021	50	0387815	0039878
11	9612472	9960061	9652318	10347682	49	0387528	0039939
12	9612759	9960000	9652657	10347343	48	0387241	0040000
13	9613045	9959939	9652996	10347004	47	0386955	0040061
14	9613332	9959878	9653335	10346665	46	0386668	0040122
15	9613618	9959817	9653674	10346326	45	0386382	0040183
16	9613905	9959756	9654013	10345987	44	0386095	0040244
17	9614191	9959695	9654352	10345648	43	0385809	0040305
18	9614477	9959634	9654690	10345310	42	0385523	0040366
19	9614763	9959573	9655029	10344971	41	0385237	0040427
20	9615049	9959512	9655367	10344633	40	0384951	0040488
21	9615335	9959451	9655706	10344294	39	0384665	0040549
22	9615621	9959390	9656044	10343956	38	0384379	0040610
23	9615906	9959329	9656382	10343618	37	0384094	0040671
24	9616192	9959268	9656721	10343279	36	0383808	0040732
25	9616477	9959207	9657059	10342941	35	0383523	0040793
26	9616762	9959146	9657397	10342603	34	0383238	0040854
27	9617048	9959085	9657735	10342265	33	0382952	0040915
28	9617333	9959024	9658073	10341927	32	0382667	0040976
29	9617618	9958963	9658411	10341589	31	0382382	0041037
30	9617902	9958902	9658748	10341252	30	0382098	0041098
	Sine Comple.	Sine.	Tangent Comple.	Tang.	65		

24	Sine.	Sine Complt.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
30	961772	995902	965870	1034129	30	038227	004097
31	961800	995896	965903	1034096	29	038199	004103
32	961828	995890	965937	1034062	28	038171	004109
33	961855	995885	965970	1034029	27	038144	004115
34	961883	995879	966004	1033995	26	038116	004120
35	961911	995873	966037	1033962	25	038088	004126
36	961938	995867	966070	1033929	24	038061	004132
37	961966	995861	966104	1033895	23	038033	004138
38	961993	995856	966137	1033862	22	038006	004143
39	962021	995850	966171	1033828	21	037978	004149
40	962048	995844	966204	1033795	20	037951	004155
41	962076	995838	966237	1033762	19	037923	004161
42	962103	995832	966270	1033729	18	037896	004167
43	962131	995827	966304	1033695	17	037868	004172
44	962158	995821	966337	1033662	16	037841	004178
45	962186	995815	966370	1033629	15	037813	004184
46	962213	995809	966403	1033596	14	037786	004190
47	962240	995803	966437	1033562	13	037759	004196
48	962268	995797	966470	1033529	12	037731	004202
49	962295	995792	966503	1033496	11	037704	004207
50	962322	995786	966536	1033463	10	037677	004213
51	962350	995780	966569	1033430	9	037649	004219
52	962377	995774	966602	1033397	8	037622	004225
53	962404	995767	966635	1033364	7	037595	004231
54	962431	995762	966669	1033330	6	037568	004237
55	962459	995756	966702	1033297	5	037540	004243
56	962486	995751	966735	1033264	4	037513	004248
57	962513	995745	966768	1033231	3	037486	004254
58	962543	995739	966801	1033198	2	037459	004260
59	962567	995733	966834	1033165	1	037432	004266
60	962594	995727	966867	1033132	0	037405	004272
	Sine Complt.	Sine.	Tangent Complt.	Tang.	65		

25	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. ta.
0	962594	995727	966867	1033132	60	037405	004272
1	962621	995721	966900	1033099	59	037378	004278
2	962648	995715	966933	1033066	58	037351	004284
3	962676	995709	966966	1033033	57	037323	004290
4	962703	995703	966999	1033000	56	037296	004296
5	962730	995698	967031	1032968	55	037269	004301
6	962757	995692	967064	1032935	54	037242	004307
7	962783	995686	967097	1032902	53	037216	004313
8	962810	995680	967140	1032869	52	037189	004319
9	962837	995674	967163	1032836	51	037162	004325
10	962864	995668	967196	1032803	50	037135	004331
11	962891	995662	967229	1032770	49	037108	004337
12	962918	995656	967261	1032738	48	037081	004343
13	962945	995650	967294	1032705	47	037054	004349
14	962972	995644	967327	1032672	46	037027	004355
15	962998	995638	967360	1032639	45	037001	004361
16	963025	995632	967392	1032607	44	036974	004367
17	963052	995626	967425	1032574	43	036947	004373
18	963070	995620	967458	1032541	42	036920	004370
19	963105	995614	967491	1032508	41	036894	004385
20	963132	995608	967523	1032476	40	036867	004391
21	963159	995602	967556	1032443	39	036840	004397
22	963185	995596	967589	1032410	38	036814	004403
23	963121	995590	967621	1042378	37	036787	004409
24	963239	995584	967654	1032345	36	036760	004415
25	963265	995578	967686	1032313	35	036734	004421
26	963292	995572	967719	1032280	34	036707	004427
27	963318	995566	967752	1032247	33	036681	004433
28	963345	995560	967784	1032215	32	036654	004439
29	963371	995554	967817	1032182	31	036628	004445
30	963398	995548	967849	1032150	30	036601	004451
	Sine Comple.	Sine.	Tangent Comple.	Tang.	64		

	Sine	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
0	963398	995548	967849	1032150	30	036601	004451
1	963424	995542	967882	1032117	29	036575	004457
2	963451	995536	967914	1032085	28	036548	004463
3	963477	995530	967947	1032052	27	036522	004469
4	963504	995524	967979	1032020	26	036495	004475
5	963530	995518	968011	1031988	25	036469	004481
6	963556	995512	968044	1031955	24	036443	004487
7	963583	995506	968076	1031923	23	036416	004493
8	963609	995500	968109	1031890	22	036390	004499
9	963636	995494	968141	1031858	21	036363	004505
10	963662	995488	968173	1031826	20	036337	004511
11	963688	995482	968206	1031793	19	036311	004517
12	963714	995476	968238	1031761	18	036285	004523
13	963741	995470	968270	1031729	17	036258	004529
14	963767	995464	968303	1031696	16	036232	004535
15	963793	995457	968335	1031664	15	036206	004542
16	963819	995451	968367	1031632	14	036180	004548
17	963845	995445	968400	1031599	13	036154	004554
18	963871	995439	968432	1031567	12	036128	004560
19	963898	995433	968464	1031535	11	036101	004566
50	963924	995427	968496	1031503	10	036075	004572
51	963950	995421	968529	1031470	9	036049	004578
52	963976	995415	968561	1031438	8	03602	004584
53	964002	995409	968593	1031406	7	035997	004590
54	964028	995402	968625	1031374	6	035971	004597
55	964054	995396	968657	1031342	5	035945	004603
56	964080	995390	968689	1031310	4	035919	004609
57	964106	995384	968721	1031278	3	035893	004615
58	964132	995378	968754	1031245	2	035867	004621
59	964158	995372	968786	1031213	1	035841	004627
60	964184	995366	968818	1031181	0	035815	004633
	Sine Comple.	Sine.	Tangent Comple.	Tang.	64		

26	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. of t.
0	964184	995366	968818	1031118	60	035815	00460
1	964210	995359	968850	1031149	59	035789	00460
2	964235	995353	968882	1031217	58	035764	00460
3	964261	995347	968914	1031085	57	035738	00460
4	964287	995341	968946	1031053	56	035712	00460
5	964312	995335	968978	1031021	55	035686	00460
6	964339	995328	969010	1030989	54	035660	00460
7	964365	995322	969042	1030957	53	035634	00460
8	964390	995316	969074	1030925	52	035609	00460
9	964416	995310	969106	1030893	51	035583	00460
10	964442	995304	969138	1030861	50	035557	00460
11	964467	995297	969170	1030830	49	035532	00470
12	964493	995291	969201	1030798	48	035506	00470
13	964519	995285	969233	1030766	47	035480	00471
14	964544	995279	969265	1030734	46	035455	00471
15	964570	995273	969297	1030702	45	035429	00471
16	964596	995266	969329	1030670	44	035403	00473
17	964621	995260	969361	1030638	43	035378	00473
18	964647	995254	969392	1030607	42	035352	00474
19	964672	995248	969424	1030575	41	035327	00475
20	964698	995241	969456	1030543	40	035301	00475
21	964723	995235	969488	1030511	39	035276	00476
22	964749	995229	969520	1030479	38	035250	00477
23	964744	995223	969551	1030448	37	035225	00477
24	964800	995216	969583	1030416	36	035199	00478
25	964825	995210	969615	1030384	35	035174	00478
26	964858	995204	969646	1030353	34	035148	00479
27	964876	995197	969678	1030321	33	035123	00480
28	964902	995191	969710	1030289	32	035097	00480
29	964927	995185	969741	1030258	31	035072	00481
30	964952	995179	969773	1030226	30	035047	00482
	Sine Comple.	Sine.	Tangent Complt.	Tang.	63		

26	Sine	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſ. co.
30	964952	995179	969773	10302226	30	035047	004820
31	964978	995172	969805	10301941	29	035021	004827
32	965003	995166	969836	10301631	28	034996	004833
33	965028	995160	969868	10301317	27	034971	004839
34	965053	995153	969900	10300999	26	034946	004846
35	965079	995147	969931	10300681	25	034920	004852
36	965104	995141	969963	10300363	24	034895	004858
37	965129	995134	969994	10300051	23	034870	004865
38	965154	995128	970026	10299733	22	034895	004871
39	965180	995122	970057	10299421	21	034819	004877
40	965205	995115	970089	10299101	20	034794	004884
41	965230	995109	970120	10298791	19	034769	004890
42	965255	995103	970152	10298471	18	034744	004896
43	965280	995096	970183	10298161	17	034719	004903
44	965305	995090	970215	10297841	16	034694	004909
45	965330	995084	970246	10297531	15	034669	004915
46	965355	995077	970278	10297211	14	034644	004922
47	965380	995071	970309	10296901	13	034619	004928
48	965405	995065	970340	10296591	12	034594	004935
49	065430	995058	970372	10296271	11	034569	004941
50	665455	995052	970403	10295961	10	034544	004947
51	965480	995045	970434	10295651	9	034519	004954
52	965505	995039	970466	10295331	8	034494	004960
53	965530	995033	970497	10295021	7	034469	004966
54	965555	995026	970528	10294711	6	034444	004973
55	965580	995020	970560	10294391	5	034419	004979
56	965605	995013	970591	10294081	4	034394	004986
57	965630	995007	970622	10293771	3	034369	004992
58	965655	995000	970654	10293451	2	034344	004999
59	965679	994994	970685	10293141	1	034320	005005
60	965704	994988	970716	10292831	0	034295	005011
	Sine Comple.	Sine.	Tangent Comple.	Tang.	63		

27	Sine.	Sine Complt.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of T. co.
0	965704	994988	970716	10292 83	60	034295	005011
1	965729	994981	970747	10292 52	59	034270	005018
2	965754	994975	970779	10292 20	58	034245	005024
3	965778	994968	970810	10291 89	57	034221	005031
4	965803	994962	970841	10291 58	56	034196	005037
5	965828	994955	970872	10291 27	55	034171	005044
6	965853	994949	970903	10290 96	54	034146	005050
7	965877	994942	970934	10290 65	53	034121	005057
8	965902	994936	970966	10290 33	52	034097	005063
9	965927	994929	970997	10290 02	51	034072	005070
10	965951	994923	971028	10289 71	50	034048	005076
11	965976	994917	971059	10289 40	49	034023	005083
12	966000	994910	971090	10289 09	48	033999	005089
13	966025	994904	971121	10288 78	47	033974	005095
14	966050	994897	971152	10288 47	46	033949	005101
15	966074	994891	971183	10288 16	45	033925	005108
16	966099	994884	971214	10287 85	44	033900	005115
17	966123	994877	971245	10287 54	43	033876	005121
18	966148	994871	971276	10287 23	42	033851	005128
19	966172	994864	971307	10286 92	41	033827	005135
20	966197	994858	971338	10286 61	40	033802	005141
21	966221	994851	971369	10286 30	39	033778	005148
22	966245	994845	971400	10285 91	38	033754	005154
23	966270	994838	971431	10285 68	37	033729	005161
24	966294	994832	971462	10285 37	36	033705	005167
25	966319	994825	971493	10285 06	35	033681	005174
26	966343	994819	971524	10284 75	34	033656	005180
27	966367	994812	971555	10284 44	33	033632	005187
28	966391	994806	971585	10284 14	32	033668	005193
29	966416	994799	971616	10283 83	31	033583	005200
30	966440	994792	971647	10283 52	30	033559	005207
	Sine Complt.	Sine.	Tangent Complt.	Tang.	61		

	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of si. co.
0	966440	994792	971647	10028352	30	033559	005207
1	966464	994786	971678	10028321	29	033535	005213
2	966488	994779	971709	10028290	28	033510	005220
3	966513	994773	971740	10028259	27	033486	005226
4	966537	994766	971770	10028229	26	033462	005233
5	966561	994759	971801	10028198	25	033438	005240
6	966585	994753	971831	10028167	24	033414	005246
7	966610	994746	971863	10028136	23	033389	005253
8	966634	994740	971894	10028105	22	033365	005259
9	966658	994733	971924	10028075	21	033341	005266
10	966682	994726	971955	10028044	20	033317	005273
11	966706	994720	971986	10028013	19	033293	005279
12	966730	994713	972016	10027983	18	033269	005286
13	966754	994707	972047	10027952	17	033245	005293
14	966778	994700	972078	10027921	16	033221	005299
15	966802	994693	972108	10027891	15	033197	005306
16	966826	994687	972139	10027860	14	033173	005312
17	966850	994680	972170	10027829	13	033149	005319
18	966874	994673	972200	10027799	12	033125	005326
19	966898	994667	972231	10027768	11	033101	005332
20	966922	994660	972262	10027737	10	033077	005339
21	966946	994653	972292	10027707	9	033053	005346
22	966970	994647	972323	10027676	8	033029	005352
23	966994	994640	972353	10027646	7	033005	005359
24	967018	994633	972384	10027615	6	032981	005366
25	967041	994627	972414	10027585	5	032958	005372
26	967065	994620	972445	10027554	4	032934	005379
27	967089	994613	972475	10027524	3	032910	005386
28	967113	994606	972506	10027493	2	032886	005393
29	967137	994600	972536	10027463	1	032862	005399
30	967160	994593	972567	10027432	0	032839	005406
	Sine Comple.	Sine.	Tangent Comple.	Tang.	61		

28	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of si. co.
0	967160	994593	972567	1027432	60	032839	005406
1	967184	994586	972597	1027402	59	032815	005413
2	967208	994580	972628	1027371	58	032791	005419
3	967232	994573	972658	1027341	57	032767	005426
4	967255	994566	972689	1027310	56	032744	005433
5	967279	994559	972719	1027280	55	032720	005440
6	967303	994553	972750	1027249	54	032696	005446
7	967329	994546	972780	1027219	53	032673	005453
8	967350	994539	972810	1027189	52	032649	005460
9	967374	994532	972841	1027158	51	032625	005467
10	967397	994526	972871	1027128	50	032602	005473
11	967421	994519	972901	1027098	49	032578	005480
12	967444	994512	972932	1027067	48	032555	005487
13	967467	994505	972962	1027037	47	032531	005494
14	967491	994498	972992	1027007	46	032508	005501
15	967515	994492	973023	1026976	45	032484	005507
16	967538	994485	973053	1026946	44	032461	005514
17	967562	994478	973083	1026916	43	032437	005521
18	967585	994471	973114	1026885	42	032414	005538
19	967609	994465	973144	1026855	41	032390	005534
20	967632	994458	973174	1026825	40	032367	005541
21	967656	994451	973204	1026795	39	032343	005548
22	967679	994444	973235	1026764	38	032320	005555
23	967703	994437	973265	1026734	37	032296	005562
24	967726	994430	973295	1026704	36	032273	005569
25	967749	994424	973325	1026674	35	032250	005575
26	967773	994417	973355	1026644	34	032226	005582
27	967796	994410	973386	1026613	33	032203	005589
28	967819	994403	973416	1026583	32	032180	005596
29	967843	994396	973446	1026553	31	032156	005603
30	967866	994389	973476	1026523	30	032133	005610
	Sine Comple.	Sine.	Tangent Comple.	Tang.	61		

28	Sine.	Sint Comple.	Tang	Tangent Complem.		Com. ar. of fine.	Com. ar. of ſi. to.
30	967866	994389	973476	1026523	30	032133	005610
31	967889	994382	973506	1026493	29	032110	005617
32	967912	994376	973536	1026463	28	032087	005625
33	967936	994369	973566	1026433	27	032063	005630
34	967959	994362	973596	1026403	26	032040	005637
35	967982	994355	973626	1026373	25	032017	005644
36	968005	994348	973656	1026343	24	031994	005651
37	968028	994341	973687	1026312	23	031971	005658
38	968051	994334	973717	1026282	22	031948	005665
39	968075	994327	973747	1026252	21	031924	005672
40	968098	994321	973777	1026222	20	031901	005678
41	968121	994314	973807	1026192	19	031878	005685
42	968144	994307	973837	1026162	18	031855	005692
43	968167	994300	973867	1026132	17	031832	005699
44	968190	994293	973897	1026102	16	031809	005706
45	968213	994286	973927	1026072	15	031786	005713
46	968236	994279	973957	1026042	14	031763	005720
47	968259	994272	973986	1026013	13	031740	005727
48	968282	994265	974016	1025983	12	031717	005734
49	968305	994258	974046	1025953	11	031694	005741
50	968328	994251	974076	1025923	10	031671	005748
51	968351	994244	974106	1025893	9	031648	005755
52	968374	994237	974136	1025863	8	031625	005762
53	968397	994230	974166	1025833	7	031602	005769
54	968420	994223	974196	1025803	6	031579	005776
55	968442	994216	974226	1025773	5	031557	005783
56	968465	994209	974255	1025744	4	031534	005790
57	968488	994202	974285	1025714	3	031511	005797
58	968511	994195	974315	1025684	2	031488	005804
59	968534	994188	974345	1025654	1	031465	005811
60	968557	994181	974375	1025624	0	031442	005818
	Sine Comple.	Sine.	Tangent Comple.	Tang.	61		

29	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. ar.
0	968557	994181	974375	1025624	60	031442	005818
1	968579	994174	974404	1025595	59	031420	005821
2	968602	994167	974434	1025565	58	031397	005832
3	968625	994160	974464	1025535	57	031374	005839
4	968648	994153	974494	1025505	56	031351	005846
5	968670	994146	974524	1025475	55	031329	005853
6	968693	994139	974553	1025446	54	031306	005860
7	968716	994132	974583	1025416	53	031283	005867
8	968738	994125	974613	1025386	52	031261	005874
9	968761	994118	974642	1025357	51	031238	005881
10	968784	994111	974672	1025327	50	031215	005888
11	968806	994104	974702	1025297	49	031193	005895
12	968829	994097	974731	1025268	48	031170	005902
13	968852	994090	974761	1025238	47	031147	005909
14	968874	994083	974791	1025208	46	031125	005916
15	968897	994076	974820	1025179	45	031102	005923
16	968919	994069	974850	1025149	44	031080	005930
17	968942	994062	974880	1025119	43	031057	005937
18	968964	994055	974909	1025090	42	031035	005944
19	968987	994048	974939	1025060	41	031012	005951
20	969009	994040	974968	1025031	40	030990	005959
21	969032	994033	974998	1025001	39	030967	005966
21	969054	994026	975028	1024971	38	030945	005973
23	969077	994019	975057	1024942	37	030922	005980
24	969099	994012	975087	1024912	36	030900	005987
25	969122	994005	975116	1024883	35	030877	005994
26	969144	993998	975146	1024853	34	030855	006001
27	969166	993991	975175	1024824	33	030833	006008
28	969189	993983	975205	1024794	32	030810	006016
29	969211	993976	975234	1024765	31	030788	006023
30	969232	993969	975264	1024735	30	030766	006030
	Sine Comple.	Sine.	Tangent Comple.	Tang.	60		

29	Sine.	Sine Comple	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
30	9692333	9933969	9752564	10247435	30	0307666	0060300
31	9692556	9933962	9752593	10247406	29	0307437	0060377
32	9692778	9933955	9752623	10247376	28	0307211	0060444
33	0693000	9933948	9752652	10247347	27	0306999	0060511
34	9693223	9933941	9752682	10247317	26	0306776	0060588
35	9693445	9933933	9752711	10247288	25	0306554	0060666
36	9693667	9933926	9752740	10247259	24	0306332	0060733
37	9693889	9933919	9752770	10247229	23	0306110	0060800
38	9694112	9933912	9752799	10247200	22	0305887	0060867
39	9694334	9933905	9752829	10247170	21	0305665	0060934
40	9694556	9933897	9752858	10247141	20	0305443	0061002
41	9694778	9933890	9752887	10247112	19	0305221	0061069
42	9695000	9933883	9752917	10247082	18	0304999	0061136
43	9695222	9933876	9752946	10247053	17	0304777	0061203
44	9695445	9933869	9752975	10247024	16	0304554	0061270
45	9695667	9933861	9753005	10246994	15	0304332	0061338
46	9695889	9933854	9753034	10246965	14	0304110	0061405
47	9696111	9933847	9753063	10246936	13	0303888	0061472
48	9696333	9933840	9753093	10246906	12	0303666	0061539
49	9696555	9933833	9753122	10246877	11	0303444	0061607
50	9696777	9933825	9753151	10246848	10	0303221	0061674
51	9696999	9933818	9753180	10246819	9	0303000	0061741
52	9697221	9933811	9753210	10246789	8	0302778	0061808
53	9697443	9933804	9753239	10246760	7	0302556	0061876
54	9697665	9933796	9753268	10246731	6	0302334	0061943
55	9697887	9933789	9753297	10246702	5	0302112	0062010
56	9698109	9933782	9760271	10239729	4	0301890	0062217
57	9698331	9933774	9760561	10239439	3	0301668	0062325
58	9698553	9933767	9760851	10239149	2	0301446	0062432
59	9698775	9933760	9761141	10238859	1	0301224	0062539
60	9698997	9933753	9761431	10238569	0	0301003	0062646
	Sine Comple.	Sine.	Tangent Comple.	Tang.	60	Sin	

30	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
0	9698 97	9937 53	9761 43	1023 850	60	030103	006246
1	9699 18	9937 45	9761 73	1023 826	59	030181	006254
2	9699 40	9937 38	9762 02	1023 797	58	030059	006261
3	9699 62	9937 31	9762 31	1023 768	57	030037	006268
4	9699 84	9937 23	9762 60	1023 739	56	030015	006276
5	9700 06	9937 16	9762 89	1023 710	55	029993	006283
6	9700 28	9937 09	9763 18	1023 681	54	029971	006290
7	9700 49	9937 01	9763 47	1023 652	53	029950	006298
8	9700 71	9936 94	9763 77	1023 623	52	029928	006305
9	9700 93	9936 87	9764 06	1023 593	51	029906	006312
10	9701 15	9936 79	9764 35	1023 564	50	029884	006320
11	9701 36	9936 72	9764 64	1023 535	49	029863	006327
12	9701 58	9936 65	9764 93	1023 506	48	029841	006334
13	9701 80	9936 57	9765 22	1023 477	47	029819	006342
14	9702 01	9936 50	9765 51	1023 448	46	029798	006349
15	9702 23	9936 43	9765 80	1023 419	45	029776	006356
16	9702 45	9936 35	9766 00	1023 399	44	029754	006364
17	9702 66	9936 28	9766 38	1023 361	43	029733	006371
18	9702 88	9936 20	9766 67	1023 332	42	029711	006379
19	9703 10	9936 13	9766 96	1023 303	41	029689	006386
20	9703 31	9936 06	9767 25	1023 274	40	029668	006393
21	9703 53	9935 98	9767 54	1023 245	39	029646	006401
22	9703 74	9935 91	9767 83	1023 216	38	029625	006408
23	9703 96	9935 84	9768 12	1023 187	37	029603	006415
24	9704 17	9935 76	9768 41	1023 158	36	029582	006423
25	9704 39	9935 69	9768 70	1023 129	35	029560	006430
26	9704 60	9935 61	9768 99	1023 100	34	029539	006438
27	9704 82	9935 54	9769 28	1023 072	33	029517	006445
28	9705 03	9935 46	9769 57	1023 042	32	029496	006453
29	9705 25	9935 39	9769 85	1023 014	31	029474	006460
30	9705 46	9935 32	9770 14	1023 985	30	029453	006467
	Sine Comple.	Sine.	Tangent Comple.	Tang.	59		

30	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of si. co.
30	970545	993532	977014	1022985	30	029453	006467
31	970568	993524	977043	1022956	29	029431	006475
32	970589	993517	977072	1022927	28	029410	006482
33	970611	993509	977101	1022898	27	029388	006490
34	970632	993502	977130	1022869	26	029367	006497
35	970653	993494	977159	1022840	25	029346	006505
36	970675	993487	977188	1022811	24	029324	006512
37	970696	993479	977216	1022783	23	029303	006520
38	970718	993472	977245	1022754	22	029281	006527
39	970739	993464	977274	1022725	21	029260	006535
40	970760	993457	977303	1022696	20	029239	006542
41	970781	993449	977332	1022667	19	029218	006550
42	970803	993442	977360	1022639	18	029196	006557
43	970824	993434	977389	1022610	17	029175	006565
44	970845	993427	977418	1022581	16	029154	006572
45	970866	993419	977447	1022552	15	029133	006580
46	970888	993412	977475	1022524	14	028111	006587
47	970909	993404	977504	1022495	13	029090	006595
48	970930	993397	977533	1022466	12	029069	006602
49	970951	993389	977562	1022437	11	029048	006610
50	970972	993382	977590	1022409	10	029027	006617
51	970994	993374	972619	1022380	9	029005	006625
52	971015	993367	977648	1022351	8	028984	006632
53	971036	993359	977676	1022323	7	028963	006640
54	971057	993352	977705	1022294	6	028942	006647
55	971078	993344	977734	1022265	5	028921	006655
56	971099	993336	977762	1022237	4	028900	006663
57	971120	993329	977791	1022208	3	028379	006670
58	971141	993321	977820	1022179	2	028858	006678
59	971162	993314	977848	1022151	1	028837	006685
60	971183	993306	977877	1022122	0	028816	006693
	Sine Comple.	Sine.	Tangent Comple.	Tang.	59		

31	Sine.	Sine Comple.	Tang	Tangent Complem.		Com ar. of sine.	Com. ar. of ti. co.
0	971183	993306	977877	1022122	60	028816	006693
1	971204	993298	977905	1022094	59	028795	006701
2	971225	993291	977934	1022065	58	028774	006708
3	971246	993283	977963	1022036	57	028753	006716
4	971267	993276	977991	1022008	56	028732	006723
5	971188	993268	978020	1021979	55	028711	006731
6	971309	993260	978048	1021951	54	028690	006739
7	971330	993253	978077	1021922	53	028669	006746
8	971351	993245	978106	1021893	52	028648	006754
9	971372	993238	978134	1021865	51	028627	006761
10	971393	993230	978163	1021836	50	028606	006769
11	971414	993222	978191	1021808	49	028585	006777
12	971435	993215	978220	1021779	48	028564	006784
13	971456	993207	978248	1021751	47	028543	006792
14	971476	993199	978277	1021722	46	028523	006800
15	971497	993192	978305	1021694	45	028502	006807
16	971518	993184	978334	1021665	44	028481	006815
17	971539	993176	978362	1021637	43	028460	006823
18	971560	993169	978391	1021608	42	028439	006830
19	971580	993161	978419	1021580	41	028419	006838
20	971601	993153	978447	1021552	40	028398	006846
21	971622	993146	978476	1021523	39	028377	006853
22	971643	993138	978504	1021495	38	028356	006861
23	971663	993130	978533	1021466	37	028336	006869
24	971684	993122	978561	1021438	36	028315	006877
25	971705	993115	978590	1021409	35	028294	006884
26	971725	993107	978618	1021381	34	028274	006892
27	971746	993099	978646	1021353	33	028253	006900
28	971767	993092	978675	1021324	32	028232	006917
29	971787	993084	978703	1021296	31	028212	006915
30	971808	993076	978731	1021268	30	028191	006923
	Sine Comple.	Sine.	Tangent Comple.	Tang.	58		

	Sine.	Sine Comple	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of si. co.
0	971808	993076	978731	10211268	30	028191	006923
1	971829	993068	978760	10211239	29	028170	006931
2	971849	993061	978788	10211211	28	028150	006938
3	971870	993053	978816	10211183	27	028129	006946
4	971890	993045	978845	10211155	26	028109	006954
5	971911	993037	978873	10211126	25	028088	006962
6	971931	993030	978901	10211098	24	028068	006969
7	971952	993022	978930	10211069	23	028047	006977
8	971973	993014	978958	10211041	22	028027	006985
9	971993	993006	978986	10211013	21	028006	006993
10	972013	992998	979015	10210984	20	028986	007001
11	972034	992991	979043	10210956	19	027965	007008
12	972054	992983	979071	10210928	18	027945	007016
13	972075	992975	979099	10210900	17	027924	007024
14	972095	992967	979128	10210871	16	027904	007032
15	972116	992959	979156	10210843	15	027883	007040
16	972136	992952	979184	10210815	14	027863	007047
17	972157	992944	979212	10210787	13	027842	007055
18	972177	992936	979241	10210758	12	027822	007063
19	972197	992928	979269	10210730	11	027802	007071
20	972218	992920	979297	10210702	10	027781	007079
21	972238	992912	979325	10210674	9	027761	007087
22	972258	992905	979353	10210646	8	027741	007094
23	972279	992897	979381	10210618	7	027720	007102
24	972299	992889	979410	10210589	6	027700	007110
25	972319	992881	979438	10210561	5	027680	007118
26	972340	992873	979466	10210533	4	027660	007126
27	972360	992865	979494	10210505	3	027635	007134
28	972380	992857	979522	10210477	2	027615	007142
29	972400	992849	979550	10210449	1	027599	007150
30	972420	992842	979578	10210421	0	027579	007157
	Sine Comple.	Sine.	Tangent comple.	Tang.	58		

32	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of sl. cu.
0	972420	992842	979578	1020421	60	027579	007157
1	972441	992834	979607	1020392	59	027558	007165
2	972461	992826	979635	1020364	58	027538	007173
3	972481	992818	979663	1020336	57	027518	007181
4	972501	992810	979691	1020308	56	027498	007189
5	972521	992802	979719	1020280	55	027478	007197
6	972542	992794	979747	1020252	54	027457	007205
7	972562	992786	979775	1020224	53	027437	007213
8	972582	992778	979803	1020196	52	027417	007221
9	972602	992770	979831	1020168	51	027397	007229
10	972622	992762	979859	1020140	50	027377	007237
11	972642	992754	979887	1020112	49	027357	007245
12	972662	992746	979915	1020084	48	027337	007253
13	972682	992738	979943	1020056	47	027317	007261
14	972702	992731	979971	1020028	46	027297	007268
15	972722	992723	979999	1020000	45	027277	007276
16	972742	992715	980027	1019972	44	027257	007284
17	972762	992707	980055	1019944	43	027237	007292
18	972782	992699	980083	1019916	42	027217	007300
19	972802	992691	980111	1019888	41	027197	007308
20	972822	992683	980139	1019860	40	027177	007316
21	972842	992675	980167	1019832	39	027157	007324
22	972862	992667	980195	1019804	38	027137	007332
23	972882	992659	980223	1019776	37	027117	007340
24	972902	992651	980251	1019748	36	027097	007348
25	972922	992643	980279	1019720	35	027077	007356
26	972942	992635	980307	1019692	34	027057	007364
27	972962	992627	980335	1019664	33	027037	007372
28	972981	992619	980362	1019637	32	027018	007380
29	973001	992610	980390	1019609	31	026998	007389
30	973021	992602	980418	1019581	30	026978	007397
	Sine Comple.	Sine.	Tangent Comple.	Tang.	57		

	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
0	973021	992602	980418	1019581	30	026978	007397
1	973041	992594	980446	1019553	29	026958	007405
2	973061	992586	930474	1019525	28	026938	007413
3	973081	992578	980502	1019497	27	026918	007421
4	973100	992570	980530	1019469	26	026899	007429
5	973120	992562	980558	1019441	25	026879	007437
6	973140	992554	980585	1019414	24	026859	007445
7	973160	992546	980613	1019385	23	026839	007453
8	973179	992538	980641	1019358	22	026820	007461
9	973199	992530	980669	1019330	21	026800	007469
10	973219	992522	980697	1019302	20	026780	007477
11	973239	992514	980724	1019275	19	026760	007485
12	973258	992505	980752	1019247	18	026741	007494
13	973278	992497	980780	1019219	17	026721	007502
14	973298	992489	980808	1019191	16	026701	007510
15	973317	992481	980836	1019163	15	026682	007518
16	973337	992473	980863	1019136	14	026662	007526
17	973356	992465	980891	1019108	13	026643	007534
18	973376	992457	980919	1019080	12	026623	007542
19	973396	992449	980947	1019052	11	026603	007550
20	973415	992440	980974	1019024	10	026584	007559
21	973435	992432	981002	1018997	9	026564	007567
22	973454	992424	981030	1018969	8	026545	007575
23	973475	992416	981057	1018942	7	026525	007583
24	973493	992408	981085	1018914	6	026506	007591
25	973513	992400	981113	1018886	5	026486	007599
26	973532	992391	981141	1018858	4	026467	007608
27	973552	992383	981168	1018831	3	026447	007618
28	973571	992375	981196	1018803	2	026428	007624
29	973591	992367	981224	1018775	1	026408	007632
30	973610	992359	981251	1018748	0	026389	007640
	Sine Comple.	Sine.	Tangent Comple.	Tang.	57		

33	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine	Com. of t.
0	973610	992359	9812 51	1018748	60	026389	0076
1	973630	992350	9812 79	1018720	59	026369	0076
2	973649	992342	9813 07	1018692	58	026350	0076
3	973669	992334	9813 34	1018665	57	026330	0076
4	973688	992326	9813 62	1018637	56	026311	0076
5	973707	992318	9813 89	1018610	55	026292	0076
6	973727	992309	9814 17	1018582	54	026272	0076
7	973746	992301	9814 45	1018554	53	026253	0076
8	973766	992293	9814 72	1018527	52	026233	0077
9	973785	992285	9815 00	1018499	51	026214	0077
10	973804	992276	9815 27	1018472	50	026195	0077
11	973824	992268	9815 55	1018444	49	026175	0077
12	973843	992260	9815 83	1018416	48	026156	0077
13	973862	992252	9816 10	1018389	47	026137	0077
14	973882	992243	9816 38	1018361	46	026117	0077
15	973901	992235	9816 65	1018334	45	026098	0077
16	973920	992227	9816 93	1018306	44	026079	0077
17	973939	992218	9817 20	1018279	43	026060	0077
18	973959	992210	9817 48	1018251	42	026040	0077
19	973978	992202	9817 75	1018224	41	026021	0077
20	973997	992194	9818 03	1018196	40	026002	0078
21	974016	992185	9818 30	1018169	39	025983	0078
22	974035	992177	9818 58	1018141	38	025964	0078
23	974055	992169	9818 85	1018114	37	025944	0078
24	974074	992160	9819 13	1018086	36	025925	0078
25	974093	992152	9819 40	1018059	35	025906	0078
26	974112	992144	9819 68	1018031	34	025887	0078
27	974131	992135	9819 95	1018004	33	025868	0078
28	974150	992127	9820 23	1017976	32	025849	0078
29	974169	992119	9820 50	1017949	31	025830	0078
30	974188	992110	9820 78	1017921	30	025811	0078
	Sine Comple.	Sine.	Tangent Comple.	Tang.	56		

Com. of si.		Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of fine.	Com. ar. of si. co.
0076	0	974180	992110	982078	1017921	30	025811	007899
0076	1	974208	992102	982106	1017894	29	025791	007897
0076	2	974227	992093	982133	1017866	28	025772	007906
0076	3	974246	992085	982160	1017839	27	025753	007914
0016	4	974265	992077	982188	1017811	26	025734	007922
0076	5	974284	992068	982215	1017784	25	025715	007931
0076	6	974303	992060	982242	1017757	24	025696	007939
0076	7	974322	992052	982270	1017729	23	025677	007948
0077	8	974341	992043	982297	1017702	22	025658	007956
0077	9	974360	992035	982325	1017674	21	025639	007964
0077	10	974379	992026	982352	1017647	20	025620	007973
0077	11	974398	992018	982379	1017620	19	025601	007981
0077	12	974417	992009	982407	1017592	18	025582	007990
0077	13	974436	992001	982434	1017565	17	025563	007998
0077	14	974454	991993	982461	1017538	16	025545	008006
0077	15	974473	991984	982489	1017510	15	025526	008015
0077	16	974492	991976	982516	1017483	14	025507	008023
0077	17	974511	991967	982543	1017456	13	025488	008032
0077	18	974530	991959	982571	1017428	12	025469	008040
0077	19	974549	991950	982598	1017401	11	025450	008049
0078	20	974568	991942	982625	1017374	10	025431	008057
0078	21	974587	991933	982653	1017346	9	025412	008066
0078	22	974605	991925	982680	1017319	8	025394	008074
0078	23	974624	991916	982707	1017292	7	025375	008083
0078	24	974643	991908	982735	1017264	6	025356	008091
0078	25	974662	991899	982762	1017237	5	025337	008100
0078	26	974681	991891	982789	1017210	4	025318	008108
0078	27	974699	991882	982816	1017183	3	025300	008117
0078	28	974718	991874	982844	1017155	2	025281	008125
0078	29	974737	991865	982871	1017128	1	025262	008134
0078	30	974756	991857	982898	1017101	0	025243	008142
		Sine Comple.	Sine.	Tangent Comple.	Tang.	56		

34	Sine.	Sine Comple	Tang	Tangent Complem.		Com. ar of sine.	Com. ar of si. co
0	9747 56	9918 57	9828 98	1017 10	60	025243	00814
1	9747 74	9918 48	9829 25	1017 074	59	025225	00815
2	9747 93	9918 40	9829 53	1017 046	58	025206	00815
3	9748 12	9918 31	9829 80	1017 019	57	025187	00816
4	9748 30	9918 23	9830 07	1016 992	56	025169	00817
5	9748 49	9918 14	9830 34	1016 965	55	025150	00818
6	9748 68	9918 06	9830 62	1016 937	54	025131	00819
7	9748 86	9917 97	9830 89	1016 910	53	025113	00820
8	9749 05	9917 89	9831 16	1016 888	52	025094	00821
9	9749 24	9917 80	9831 43	1016 856	51	025075	00821
10	9749 42	9917 71	9831 70	1016 829	50	025037	00822
11	9749 61	9917 63	9831 98	1016 801	49	025038	00823
12	9749 80	9917 54	9832 25	1016 774	48	025019	00824
13	9749 98	9917 46	9832 52	1016 747	47	025001	00825
14	9750 17	9917 37	9832 79	1016 720	46	024982	00826
15	9750 35	9917 29	9833 06	1016 693	45	024964	00827
16	9750 54	9917 20	9833 33	1016 666	44	024945	00827
17	9750 72	9917 11	9833 61	1016 638	43	024927	00828
18	9750 91	9917 03	9833 88	1016 611	42	024908	00829
19	9751 09	9916 94	9834 15	1016 584	41	024890	00830
20	9751 28	9916 85	9834 42	1016 557	40	024871	00831
21	9751 46	9916 77	9834 69	1016 530	39	024853	00832
22	9751 65	9916 68	9834 96	1016 503	38	024834	00833
23	9751 83	9916 60	9835 23	1016 476	37	024816	00833
24	9752 02	9916 51	9835 50	1016 449	36	024897	00834
25	9752 20	9916 42	9835 78	1016 421	35	024779	00835
26	9752 39	9916 34	9836 05	1016 394	34	024760	00836
27	9752 57	9916 25	9836 32	1016 367	33	024742	00837
28	9752 76	9916 16	9836 59	1016 340	32	024723	00838
29	9752 94	9916 08	9836 86	1016 313	31	024705	00839
30	9753 12	9915 99	9837 13	1016 286	30	024687	00830
	Sine Comple.	Sine.	Tangent Comple.	Tang.	55		

34	Sine	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
30	975312	991599	983713	1016286	30	024687	008400
31	975331	991590	983740	1016259	29	024668	008409
32	975349	991582	983767	1016232	28	024650	008418
33	975367	991573	983794	1016205	27	024632	008426
34	975386	991564	983821	1016178	26	024612	008435
35	975404	991555	983848	1016151	25	024595	008444
36	975422	991547	983875	1016124	24	024577	008452
37	975441	991538	983902	1016097	23	024558	008461
38	975459	991529	983929	1016070	22	024549	008470
39	975477	991521	983956	1016043	21	024522	008478
40	975496	991512	983983	1016016	20	024503	008487
41	975514	991503	984010	1015989	19	024485	008496
42	975532	991494	984037	1015962	18	024467	008505
43	975550	991486	984064	1015935	17	024449	008513
44	975569	991477	984091	1015908	16	024430	008522
45	975587	991468	984118	1015881	15	024412	008531
46	975605	991459	984145	1015854	14	024394	008540
47	975623	991450	984172	1015827	13	024376	008549
48	975641	991442	984199	1015800	12	024358	008557
49	975659	991433	984226	1015773	11	024340	008566
50	975678	991424	984253	1015746	10	024321	008575
51	975696	991415	984280	1015719	9	024303	008584
52	975714	991407	984307	1015692	8	024285	008592
53	975732	991398	984334	1015665	7	024267	008601
54	975750	991389	984361	1015638	6	024249	008610
55	975768	991380	984388	1015611	5	024231	008619
56	975786	991371	984415	1015584	4	024213	008628
57	975804	991362	984441	1015558	3	024195	008637
58	975823	991354	984468	1015531	2	024176	008645
59	975841	991345	984495	1015504	1	024158	008654
60	975859	991336	984522	1015477	0	024140	008663
	Sine Comple.	Sine.	Tangent Comple.	Tang.	55		

34	Sine.	Sine Comple	Tang	Tangent Complem.		Com. ar of sine.	Com. ar of si. co
0	974756	991857	982898	1017101	60	025243	008143
1	974774	991848	982925	1017074	59	025225	008151
2	974793	991840	982953	1017046	58	025206	008159
3	974812	991831	982980	1017019	57	025187	008168
4	974830	991823	983007	1016992	56	025169	008176
5	974849	991814	983034	1016965	55	025150	008185
6	974868	991806	983062	1016937	54	025131	008193
7	974886	991797	983089	1016910	53	025113	008202
8	974905	991789	983116	1016888	52	025094	008210
9	974924	991780	983143	1016856	51	025075	008219
10	974942	991771	983170	1016829	50	025037	008228
11	974961	991763	983198	1016801	49	025038	008236
12	974980	991754	983225	1016774	48	025019	008245
13	974998	991746	983252	1016747	47	025001	008253
14	975017	991737	983279	1016720	46	024982	008262
15	975035	991729	983306	1016693	45	024964	008271
16	975054	991720	983333	1016666	44	024945	008279
17	975072	991711	983361	1016638	43	024927	008288
18	975091	991703	983388	1016611	42	024908	008296
19	975109	991694	983415	1016584	41	024890	008305
20	975128	991685	983442	1016557	40	024871	008314
21	975146	991677	983469	1016530	39	024853	008322
22	975165	991668	983496	1016503	38	024834	008331
23	975183	991660	983523	1016476	37	024816	008339
24	975202	991651	983550	1016449	36	024897	008348
25	975220	991642	983578	1016421	35	024779	008357
26	975239	991634	983605	1016394	34	024760	008365
27	975257	991625	983632	1016367	33	024742	008374
28	975276	991616	983659	1016340	32	024723	008383
29	975294	991608	983686	1016313	31	024705	008391
30	975312	991599	983713	1016286	30	024687	008300
	Sine Comple.	Sine.	Tangent Comple.	Tang.	55		

34	Sine	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
30	975312	991599	983713	1016286	30	024687	008400
31	975331	991590	983740	1016255	29	024668	008409
32	975349	991582	983767	1016232	28	024650	008418
33	975367	991573	983794	1016205	27	024632	008426
34	975386	991564	983821	1016178	26	024612	008435
35	975404	991555	983848	1016151	25	024595	008444
36	975422	991547	983875	1016124	24	024577	008452
37	975441	991538	983902	1016097	23	024558	008461
38	975459	991529	983929	1016070	22	024549	008470
39	975477	991521	983956	1016043	21	024522	008478
40	975496	991512	983983	1016016	20	024503	008487
41	975514	991503	984010	1015989	19	024485	008496
42	975532	991494	984037	1015962	18	024467	008505
43	975550	991486	984064	1015935	17	024449	008513
44	975569	991477	984091	1015908	16	024430	008522
45	975587	991468	984118	1015881	15	024412	008531
46	975605	991459	984145	1015854	14	024394	008540
47	975623	991450	984172	1015827	13	024376	008549
48	975641	991442	984199	1015800	12	024358	008557
49	975659	991433	984226	1015773	11	024340	008566
50	975678	991424	984253	1015746	10	024321	008575
51	975696	991415	984280	1015719	9	024303	008584
52	975714	991407	984307	1015692	8	024285	008592
53	975732	991398	984334	1015665	7	024267	008601
54	975750	991389	984361	1015638	6	024249	008610
55	975768	991380	984388	1015611	5	024231	008619
56	975786	991371	984415	1015584	4	024213	008628
57	975804	991362	984441	1015558	3	024195	008637
58	975823	991354	984468	1015531	2	024176	008645
59	975841	991345	984495	1015504	1	024158	008654
60	975859	991336	984522	1015477	0	024140	008663
	Sine Comple.	Sine.	Tangent Comple.	Tang.	55		

35	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of si. co.
0	975859	991336	984522	1015477	60	024140	008663
1	975877	991327	984549	1015450	59	024122	008672
2	975895	991318	984576	1015423	58	024104	008681
3	975913	991309	984603	1015396	57	024086	008690
4	975913	991301	984630	1015369	56	024068	008698
5	975949	991292	984657	1015342	55	024050	008707
6	975967	991283	984683	1015316	54	024032	008716
7	975985	991274	984710	1015289	53	024014	008725
8	976003	991265	984737	1015262	52	023996	008734
9	976021	991256	984764	1015235	51	023978	008743
10	976038	991247	984791	1015208	50	023961	008752
11	976056	991238	984818	1015181	49	023943	008761
12	976074	991229	984844	1015155	48	023925	008770
13	976192	991220	984871	1015128	47	023907	008779
14	976110	991212	984898	1015101	46	023889	008787
15	976128	991203	984925	1015074	45	023871	008796
16	976146	991194	984952	1015047	44	023853	008805
17	976164	991185	984978	1015021	43	023835	008814
18	976182	991176	985005	1014994	42	023817	008823
19	976199	991167	985032	1014967	41	023800	008832
20	976217	991158	985059	1014940	40	023782	008841
21	976235	991149	985086	1014913	39	023764	008850
22	976253	991140	985112	1014887	38	023746	008859
23	976271	991131	985139	1014860	37	023728	008868
24	976288	991122	985166	1014833	36	023711	008877
25	976306	991113	985193	1014806	35	023693	008886
26	976324	991104	985219	1014780	34	023675	008895
27	976342	991095	985246	1014753	33	023657	008904
28	976359	991086	985273	1014726	32	023640	008913
29	976377	991077	985300	1014609	31	023622	008922
30	976395	991068	985326	1014673	30	023604	008931
	Sine Comple.	Sine.	Tangent Comple.	Tang.	54		

35	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
30	9·76395	9·91068	9·85326	10·14673	30	0·23604	0·08931
31	9·76413	9·91059	9·85353	10·14646	29	0·23586	0·08940
32	9·76430	9·91050	9·85380	10·14619	28	0·23569	0·08949
33	9·76448	9·91041	9·85406	10·14593	27	0·23551	0·08958
34	9·76466	9·91032	9·85433	10·14566	26	0·23533	0·08967
35	9·76483	9·91023	9·85460	10·14539	25	0·23516	0·08976
36	9·76501	9·91014	9·85487	10·14512	24	0·23498	0·08985
37	9·76519	9·91005	9·85513	10·14486	23	0·23480	0·08994
38	9·76536	9·90996	9·85540	10·14459	22	0·23463	0·09003
39	9·76554	9·90987	9·85567	10·14432	21	0·23445	0·09012
40	9·76571	9·90978	9·85593	10·14406	20	0·23428	0·09021
41	9·76589	9·90969	9·85620	10·14379	19	0·23410	0·09030
42	9·76607	9·90960	9·85647	10·14352	18	0·23392	0·09039
43	9·76624	9·90950	9·85673	10·14326	17	0·23375	0·09049
44	9·76642	9·90941	9·85700	10·14299	16	0·23357	0·09058
45	9·76659	9·90932	9·85727	10·14272	15	0·23340	0·09067
46	9·76677	9·90923	9·85753	10·14246	14	0·23322	0·09076
47	9·76694	9·90914	9·85780	10·14219	13	0·23305	0·09085
48	9·76712	9·90905	9·85806	10·14193	12	0·23287	0·09094
49	9·76729	9·90896	9·85833	10·14166	11	0·23270	0·09103
50	9·76747	9·90887	9·85860	10·14139	10	0·23252	0·09112
51	9·76764	9·90878	9·85886	10·14113	9	0·23235	0·09121
52	9·76782	9·90869	9·85913	10·14086	8	0·23217	0·09130
53	9·76799	9·90859	9·85940	10·14059	7	0·23200	0·09140
54	9·76817	9·90850	9·85966	10·14033	6	0·23182	0·09149
55	9·76834	9·90841	9·85993	10·14006	5	0·23165	0·09158
56	9·76852	9·90832	9·86019	10·13980	4	0·23147	0·09167
57	9·76869	9·90823	9·86046	10·13953	3	0·23130	0·09176
58	9·76887	9·90814	9·86072	10·13927	2	0·23112	0·09185
59	9·76904	9·90804	9·86099	10·13900	1	0·23095	0·09195
60	9·76921	9·90795	9·86126	10·13873	0	0·23078	0·09204
	Sine Comple.	Sine.	Tangent Comple.	Tang.	54		

36	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
0	976921	990795	986126	1013873	60	023078	009204
1	976939	990786	986152	1013847	59	023060	009213
2	976956	990777	986179	1013820	58	023043	009222
3	976973	990768	986205	1013794	57	023026	009231
4	976991	990759	986232	1013767	56	023008	009240
5	977008	990749	986258	1013741	55	022991	009250
6	977026	990740	986285	1013714	54	022973	009259
7	977043	990731	986311	1013688	53	022956	009268
8	977060	990722	986338	1013661	52	022939	009277
9	977077	990712	986365	1013635	51	022922	009287
10	977095	990703	986391	1013608	50	022904	009296
11	977112	990694	986418	1013581	49	022887	009305
12	977129	990685	986444	1013555	48	022870	009314
13	977147	990675	986471	1013528	47	022852	009324
14	977164	990666	986497	1013502	46	022835	009333
15	977181	990657	986524	1013475	45	022818	009342
16	977198	990648	986550	1013449	44	022801	009351
17	977215	990638	986577	1013423	43	022784	009361
18	977233	990629	986603	1013396	42	022766	009370
19	977250	990620	986629	1013370	41	022749	009379
20	977267	990611	986656	1013343	40	022732	009388
21	977284	990601	986682	1013317	39	022715	009398
22	977301	990592	986709	1013290	38	022698	009407
23	977319	990583	986735	1013264	37	022681	009416
24	977336	990573	986762	1013237	36	022663	009426
25	977353	990564	986788	1013211	35	022646	009435
26	977370	990555	980815	1013184	34	022625	009444
27	977387	990545	986841	1013158	33	022612	009454
28	977404	990536	986868	1013131	32	022595	009463
29	977421	990527	986894	1013105	31	022578	009472
30	977438	990517	986920	1013079	30	021561	009482
	Sine Comple.	Sine.	Tangent Comple.	Tang.	53		

36	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
30	977438	990517	986920	1013079	30	022561	009484
31	977455	990508	986947	1013052	29	022544	009491
32	977472	990499	986973	1013026	28	022527	009500
33	977489	990489	987000	1012999	27	022510	009510
34	977506	990480	987026	1012973	26	022493	009519
35	977523	990471	087052	1012947	25	022470	009528
36	977541	990461	987079	1012920	24	022458	009538
37	977558	990452	987105	1012894	23	022441	009547
38	977575	990442	987132	1012867	22	022424	009557
39	977591	990433	987158	1012841	21	022408	009566
40	977608	990424	987184	1012815	20	022391	009575
41	977629	990414	987211	1012788	19	022374	009585
42	977642	990405	987237	1012761	18	022357	009594
43	977659	990395	987263	1012736	17	022340	009604
44	977676	990386	987290	1012709	16	022323	009613
45	977693	990377	987316	1012683	15	022306	009622
46	977710	990367	987343	1012656	14	022289	009632
47	977727	990358	987369	1012630	13	022272	009641
48	977744	990348	987395	1012604	12	022255	009651
49	977761	990339	987422	1012577	11	022238	009660
50	977778	990329	987448	1012551	10	022221	009670
51	977795	990320	987474	1012525	9	022204	009679
52	977811	990310	987501	1012498	8	022188	009689
53	977828	990301	987527	1012472	7	022171	009698
54	977845	990291	98755	1012446	6	022154	009708
55	977862	990282	987579	1012420	5	022137	009717
56	977879	990272	987606	1012393	4	022120	009727
57	977895	990263	987632	1012367	3	022104	009736
58	977912	990253	987658	1012341	2	022087	009746
59	977929	990244	987685	1012314	1	022070	009755
60	977946	990234	087711	1012288	0	022053	009765
	Sine Comple.	Sine.	Tangent Comple.	Tang.	53		

37	Sine	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.	37
0	977946	990234	987711	1012288	60	022053	009765	30
1	977963	990225	987737	1012262	59	022036	009774	31
2	977979	990215	987764	1012236	58	022020	009784	32
3	977996	990206	987790	1012209	57	022003	009793	33
4	978013	990196	987816	1012183	56	021986	009803	34
5	978030	990187	987842	1012157	55	021970	009812	35
6	978046	990177	987869	1012130	54	021953	009822	36
7	978063	990168	987895	1012104	53	021936	009831	37
8	978080	990158	987921	1012078	52	021919	009841	38
9	978096	990148	987947	1012052	51	021903	009851	39
10	978113	990139	987974	1012025	50	021886	009860	40
11	978130	990129	988000	1011999	49	021869	009870	41
12	978146	990120	988026	1011973	48	021853	009879	42
13	978163	990110	988052	1011947	47	021836	009889	43
14	978180	990101	988079	1011921	46	021819	009898	44
15	978196	990091	988105	1011894	45	021803	009908	45
16	978213	990081	988131	1011868	44	021786	009918	46
17	978229	990072	988157	1011842	43	021770	009927	47
18	978246	990062	988183	1011816	42	021753	009937	48
19	978263	990052	988210	1011789	41	021736	009947	49
20	978279	990043	988236	1011763	40	021720	009956	50
21	978296	990033	988262	1011737	39	021703	009966	51
22	978312	990024	988288	1011711	38	021687	009975	52
23	978329	990014	988314	1011685	37	021670	009985	53
24	978345	990004	988341	1011658	36	021654	009995	54
25	978362	989995	988367	1011632	35	021637	000004	55
26	978378	989985	988393	1011606	34	021621	000014	56
27	978395	989975	988419	1011580	33	021604	000024	57
28	978411	989966	988445	1011554	32	021588	000033	58
29	978428	989956	988471	1011528	31	021571	000043	59
30	978444	989946	988498	1011501	30	021555	000053	60
	Sine Comple.	Sine.	Tangent Comple.	Tang.	52			

37	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ti. co.
30	978444	989946	988498	1011501	30	021555	010053
31	978461	989936	988524	1011475	29	021538	010063
32	978477	989927	988550	1011449	28	021522	010072
33	978494	989917	988576	1011423	27	021505	010082
34	978510	989907	988602	1011397	26	021489	010092
35	978526	989898	988628	1011371	25	021473	010101
36	978543	989888	988654	1011345	24	021456	010111
37	978559	989878	988681	1011318	23	021440	010121
38	978576	989868	988707	1011292	22	021423	010131
39	978592	989859	988733	1011266	21	021407	010140
40	978608	989849	988759	1011240	20	021391	010150
41	978625	989839	988785	1011214	19	021374	010160
42	978641	989829	988811	1011188	18	021358	010170
43	978657	989820	988837	1011162	17	021342	010179
44	978674	989810	988863	1011136	16	021325	010189
45	978690	989800	988889	1011110	15	021309	010199
46	978706	989790	988916	1011083	14	021293	010209
47	978723	989781	988942	1011057	13	021276	010218
48	978739	989771	988968	1011031	12	021260	010228
49	978755	989761	988994	1011005	11	021244	010238
50	978772	989751	989020	1010979	10	021227	010248
51	978788	989741	989046	1010953	9	021211	010258
52	978804	989731	989072	1010927	8	021195	010268
53	978820	989722	989098	1010901	7	021179	010277
54	978837	989712	989124	1010875	6	021162	010287
55	978853	989702	989150	1010849	5	021146	010297
56	978869	989692	989176	1010823	4	021130	010307
57	978885	989682	989202	1010797	3	021114	010317
58	978901	989672	989228	1010771	2	021098	010327
59	978918	989663	989254	1010745	1	021081	010336
60	978934	989653	989280	1010719	0	021065	010346
	Sine Comple.	Sine.	Tangent Comple.	Tang.	52		

38	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of si. co.
0	978934	989653	989280	1010719	60	021065	010346
1	978950	989643	989307	1010692	59	021049	010356
2	978966	989633	989333	1010666	58	021033	010366
3	978982	989623	989359	1010640	57	021017	010376
4	978998	989613	989385	1010614	56	021001	010386
5	979014	989603	989411	1010588	55	020985	010396
6	979031	989593	989437	1010562	54	020968	010406
7	979047	289583	989463	1010536	53	020952	010416
8	979063	989574	989489	1010510	52	020936	010425
9	979079	989564	989515	1010484	51	020920	010435
10	979095	989554	989541	1010458	50	020904	010445
11	979111	989544	989567	1010432	49	020888	010455
12	979127	989534	989593	1010406	48	020872	010465
13	979143	999524	989619	1010380	47	020856	010475
14	979159	989514	989645	1010354	46	020840	010485
15	979175	989504	989671	1010328	45	020824	010495
16	979191	989494	989697	1010302	44	020808	010505
17	979207	989484	989723	1010276	43	020792	010515
18	979223	989474	989749	1010250	42	020776	010525
19	979239	989464	989875	1010224	41	020760	010535
20	979255	989454	989801	1010198	40	020744	010545
21	979271	989444	989827	1010173	39	020728	010555
22	979287	989434	989852	1010147	38	020712	010565
23	979303	989424	989878	1010121	37	020696	010575
24	979319	989414	989904	1010095	36	020680	010585
25	979335	989404	989930	1010069	35	020664	010595
26	979351	989394	989956	1010043	34	020648	010605
27	979367	989384	989982	1010017	33	020632	010615
28	979383	989374	990008	1009991	32	020616	010625
29	979399	989364	990034	1009965	31	020600	010635
30	979417	989354	990060	1009939	30	020585	010645
	Sine Comple.	Sine.	Tangent Comple.	Tang.	51		

8	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
0	979414	989354	990065	1009939	30	020585	010645
1	979430	989344	990086	1009913	29	020569	010655
2	979446	989334	990112	1009887	28	020553	010665
3	979462	989324	990138	1009861	27	020537	010675
4	979478	989314	990164	1009835	26	020521	010685
5	979494	989304	990190	1009809	25	020505	010695
6	979510	989294	990216	1009783	24	020489	010705
7	979525	989283	990241	1009758	23	020474	010716
8	979541	989273	990267	1009732	22	020458	010726
9	979557	989263	990293	1009706	21	020442	010736
0	979573	989253	990319	1009680	20	020426	010746
1	979599	989243	990345	1009654	19	020410	010756
2	979604	989233	990371	1009628	18	020395	010766
3	979620	989223	990397	1009602	17	020379	010776
4	979636	989213	990423	1009576	16	020363	010786
5	979652	989203	990449	1009550	15	020347	010796
6	979667	989192	990474	1009525	14	020332	010807
7	979683	989182	990500	1009499	13	020316	010817
8	979699	989172	990526	1009473	12	020300	010827
9	979715	989162	990552	1009447	11	020284	010837
0	979730	989152	990578	1009421	10	020269	010847
1	979746	989142	990604	1009395	9	020253	010857
2	979762	989131	990630	1009369	8	020237	010868
3	979777	989121	990656	1009343	7	020222	010878
4	979793	989111	990681	1009318	6	020206	010888
5	979809	989101	990707	1009292	5	020190	010898
6	979824	989091	990733	1009266	4	020175	010908
7	979840	989080	990759	1009240	3	020159	010919
8	979855	989070	990785	1009214	2	020144	010929
9	979871	989060	990811	1009188	1	020128	010939
60	979887	989050	990836	1009163	0	020112	010949
	Sine Comple.	Sine.	Tangent Comple.	Tang.	51		

39	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. c
0	979887	989050	990836	1009163	60	020112	01094
1	979902	989040	990862	1009137	59	020097	01095
2	979918	989029	990888	1009111	58	020081	01097
3	979933	989019	990914	1009085	57	020066	01098
4	979949	989009	990940	1009059	56	020050	01099
5	979965	988999	990966	1009033	55	020034	01100
6	979980	988988	990991	1009008	54	020019	01101
7	979996	988978	991017	1008982	53	020003	01102
8	980011	988968	991043	1008956	52	019988	01103
9	980027	988957	991069	1008930	51	019972	01104
10	980042	988947	991095	1008904	50	019957	01105
11	980058	988937	991120	1008879	49	019941	01106
12	980073	988927	991146	1008853	48	019926	01107
13	980089	988916	991172	1008827	47	019910	01108
14	980104	988906	991198	1008801	46	019895	01109
15	980120	988896	991224	1008775	45	019879	01110
16	980135	988885	991249	1008750	44	019864	01111
17	980151	988875	991275	1008724	43	019848	01112
18	980166	988865	991301	1008698	42	019833	01113
19	980181	988854	991327	1008672	41	019818	01114
20	980197	988844	991352	1008647	40	019802	01115
21	980212	988834	991378	1008621	39	019787	01116
22	980228	988823	991404	1008595	38	019773	01117
23	980243	988813	991430	1008569	37	019756	01118
24	980258	988802	991455	1008544	36	019741	01119
25	980274	988792	991481	1008518	35	019725	01120
26	980289	988782	991507	1008492	34	019710	01121
27	980305	988771	991533	1008466	33	019694	01122
28	980320	988761	991558	1008441	32	019679	01123
29	980335	988751	591584	1008415	31	019664	01124
30	980351	988740	991610	1008389	30	019648	01125
	Sine Comple.	Sine.	Tangent Comple.	Tang.	50		

39	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
30	980351	938740	991610	1008838	30	019648	011259
31	980366	988730	991636	1008363	29	019633	011269
32	980381	988719	991661	1008338	28	019618	011280
33	980396	988709	991687	1008312	27	019603	011290
34	980412	988698	991713	1008286	26	019587	011301
35	980427	988688	991739	1008260	25	019572	011311
36	980442	988678	991764	1008235	24	019557	011321
37	980458	988667	991790	1008209	23	019541	011332
38	980473	988657	991816	1008183	22	019526	011342
39	980488	988646	991841	1008158	21	019511	011353
40	980503	988636	991867	1008132	20	019496	011363
41	980519	988625	991893	1008106	19	019480	011374
42	980534	988615	991919	1008080	18	019465	011384
43	980549	988604	991944	1008055	17	019450	011395
44	980564	988594	991970	1008029	16	019435	011405
45	980579	988583	991996	1008003	15	019420	011416
46	980595	988573	992021	1007978	14	019404	011426
47	980610	988562	992047	1007952	13	019389	011437
48	980625	988552	992073	1007926	12	019374	011447
49	980640	988541	992098	1007901	11	019359	011458
50	980655	988531	992124	1007875	10	019344	011468
51	980670	988520	992150	1007849	9	019329	011479
52	980686	988510	992176	1007823	8	019313	011490
53	980701	988499	992201	1007798	7	019298	011500
54	980716	988488	992227	1007772	6	019283	011511
55	980731	988478	992253	1007746	5	019268	011521
56	980746	988467	992278	1007721	4	019253	011532
57	980761	988457	992304	1007695	3	019238	011542
58	980776	988446	992330	1007669	2	019223	011553
59	980791	988435	992355	1007644	1	019208	011564
60	980806	988425	992381	1007618	0	019193	011574
	Sine Comple.	Sine.	Tangent Comple.	Tang.	50		

40	Sine.	Sine Comple	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of si .co.
0	9808o6	9884z5	9923z1	10076z8	60	0191z3	0115z4
1	9808z1	9884z4	9924o7	10075z2	59	0191z8	0115z5
2	9808z6	9884o4	9924z2	10075z7	58	0191z3	0115z5
3	9808z1	9883z3	9924z8	10075z1	57	0191z8	0116o6
4	9808z6	9883z2	9924z3	10075z6	56	0191z3	0116z7
5	9808z1	9883z2	9925o9	10074o0	55	0191z8	0116z7
6	9808z6	9883z1	9925z5	10074z4	54	0191o3	0116z8
7	9809z1	9883z1	9925z6o	10074z9	53	0192o8	0116z8
8	9809z6	9883z4o	9925z86	10074z3	52	0192o7	0116z9
9	9809z1	9883z29	9926z12	10073z7	51	0192o5	0116z7o
10	9809z6	9883z19	9926z37	10073z62	50	0192o4	0116z8o
11	9809z1	9883o8	9926z63	10073z36	49	0192o2	0116z9z
12	9809z8	9882z7	9926z89	10073z1o	48	0192o1	0117o2
13	9810o1	9882z7	9927z14	10072z85	47	0189z8	0117z1
14	9810z9	9882z6	9927z4o	10072z59	46	0189z3	0117z3
15	9810z1	9882z5	9927z65	10072z34	45	0189z8	0117z4
16	9810z6	9882z4	9927z91	10072o8	44	0189z3	0117z5
17	9810z1	9882z4	9928z17	10071z82	43	0189z8	0117z5
18	9810z6	9882z3	9928z42	10071z57	42	0189z3	0117z6
19	9810z1	9882z2	9928z68	10071z31	41	0189o8	0117z7
20	9811o6	9882z2	9928z93	10071o6	40	0188z3	0117z8
21	9811z0	9882o1	9929z19	10070z8o	39	0188z9	0117z8
22	9811z5	9881z9o	9929z45	10070z54	38	0188z4	0118o9
23	9811z5o	9881z79	9929z7o	10070z29	37	0188z9	0118z0
24	9811z65	9881z69	9929z96	10070o3	36	0188z4	0118z0
25	9811z8o	9881z58	9930z21	10069z78	35	0188z9	0118z1
26	9811z95	9881z47	9930z47	10069z52	34	0188o4	0118z2
27	9812z1o	9881z36	9930z73	10069z26	33	0187z89	0118z3
28	9812z24	9881z26	9930z98	10069o1	32	0187z75	0118z73
29	9812z39	9881z15	9931z24	10068z75	31	0187z6o	0118z84
30	9812z54	9881o4	9931z49	10068z5o	30	0187z45	0118z95
	Sine Comple.	Sine.	Tangent Comple.	Tang.	49		

40'	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine	Com. ar. of ſi. co.
30	981254	988104	993149	1006850	30	018745	011895
31	981269	988093	993175	1006824	29	018730	011906
32	981284	988082	993201	1006798	28	018715	011917
33	981298	988072	993226	1006773	27	018701	011927
34	981313	988061	993252	1006747	26	018686	011938
35	981328	988050	993277	1006722	25	018671	011949
36	981343	988039	993303	1006696	24	018656	011960
37	981357	988028	993328	1006671	23	018642	011971
38	981372	988018	993354	1006645	22	018627	011981
39	981387	988007	993380	1006619	21	018612	011992
40	981401	987996	993405	1006594	20	018598	012003
41	981416	987986	993431	1006568	19	018583	012014
42	981431	987974	993456	1006543	18	018568	012025
43	981446	987963	993482	1006517	17	018554	012039
44	981460	987952	993507	1006492	16	018539	012047
45	981475	987941	993533	1006466	15	018524	012058
46	981489	987931	993553	1006441	14	018510	012068
47	981504	987920	993584	1006415	13	018495	012079
48	981519	987909	993609	1006390	12	018480	012090
49	981533	987898	993635	1006364	11	018466	012101
50	981548	987887	993661	1006339	10	018451	012112
51	981563	987876	993686	1006313	9	018436	012123
52	981577	987865	993712	1006287	8	018422	012134
53	981592	987854	993737	1006262	7	018407	012145
54	981606	987843	993763	1006236	6	018393	002156
55	981621	987832	993788	1006211	5	018378	012167
56	981636	987821	993814	1006185	4	018363	012178
57	981650	987810	993839	1006160	3	018349	012189
58	981665	987799	993865	1006134	2	018334	012200
59	981679	987788	993890	1006109	1	018320	012211
60	981694	987777	993916	1006083	0	018305	012222
	Sine Comple.	Sine.	Tangent Comple.	Tang.	49		

41	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.	41
0	9981694	9987777	9993916	10006083	60	0018305	0012222	30
1	9981708	9987767	9993941	10006058	59	0018291	0012233	31
2	9981723	9987756	9993967	10006032	58	0018276	0012243	32
3	9981737	9987745	9993992	10006007	57	0018262	0012254	33
4	9981752	9987734	9994018	10005981	56	0018247	0012265	34
5	9981766	9987723	9994043	10005956	55	0018233	0012277	35
6	9981781	9987711	9994069	10005930	54	0018218	0012288	36
7	9981795	9987700	9994094	10005905	53	0018204	0012299	37
8	9981810	9987689	9994120	10005879	52	0018189	0012310	38
9	9981824	9987678	9994145	10005854	51	0018175	0012321	39
10	9981839	9987667	9994171	10005828	50	0018160	0012332	40
11	9981853	9987656	9994196	10005803	49	0018146	0012343	41
12	9981868	9987645	9994222	10005777	48	0018131	0012354	42
13	9981882	9987634	9994247	10005752	47	0018117	0012365	43
14	9981896	9987623	9994272	10005726	46	0018103	0012376	44
15	9981911	9987612	9994298	10005701	45	0018088	0012387	45
16	9981925	9987601	9994324	10005675	44	0018074	0012398	46
17	9981940	9987590	9994349	10005650	43	0018059	0012409	47
18	9981954	9987579	9994375	10005624	42	0018045	0012420	48
19	9981968	9987568	9994400	10005599	41	0018031	0012431	49
20	9981983	9987557	9994426	10005573	40	0018016	0012442	50
21	9981997	9987545	9994451	10005538	39	0018002	0012454	51
22	9982011	9987534	9994477	10005522	38	0017988	0012465	52
23	9982026	9987523	9994502	10005497	37	0017973	0012476	53
24	9982040	9987512	9994528	10005471	36	0017959	0012487	54
25	9982054	9987501	9994553	10005446	35	0017945	0012498	55
26	9982069	9987490	9994579	10005421	34	0017930	0012509	56
27	9982083	9987479	9994604	10005395	33	0017916	0012520	57
28	9982097	9987467	9994629	10005370	32	0017902	0012532	58
29	9982112	9987456	9994655	10005344	31	0017887	0012543	59
30	9982126	9987445	9994680	10005319	30	0017873	0012554	60
	Sine Comple.	Sine.	Tangent Comple.	Tang.	48			

41	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
30	982126	987445	994680	1005315	30	017873	012554
31	982140	987434	994706	1005293	29	017859	012565
32	982255	987423	994731	1005268	28	017845	012576
33	982169	987412	994757	1005242	27	017836	012587
34	982183	987400	994782	1005217	26	017816	012599
35	982197	987489	994808	1005191	25	017802	012610
36	982211	987378	994833	1005166	24	017788	012621
37	982226	987367	994858	1005141	23	017773	012632
38	982240	987355	994884	1005115	22	017759	012644
39	982254	987344	994909	1005090	21	017745	012655
40	982268	987333	994935	1005064	20	017731	012666
41	982283	987322	994960	1005039	19	017716	012677
42	982297	987311	994986	1095013	18	017702	012688
43	982311	987299	995011	1004988	17	017688	012700
44	982325	987288	995037	1004962	16	017674	012711
45	982339	987277	995062	1004937	15	017660	012722
46	982353	987265	995087	1004912	14	017646	012734
47	982368	987254	995113	1004886	13	017632	012745
48	982382	987243	995138	1004861	12	017617	012756
49	982396	987232	995164	1004835	11	017603	012767
50	982410	987220	995189	1004810	10	017589	012779
51	982424	987209	995215	1004784	9	017575	012790
52	982438	987198	995240	1004759	8	017561	012801
53	982452	987186	995265	1004734	7	017547	012813
54	982466	987175	995291	1004708	6	017533	012824
55	982480	987164	995316	1004683	5	017519	012835
56	982494	987152	995342	1004657	4	017505	012847
57	982508	987141	995367	1004632	3	017491	012858
58	982523	987130	995392	1004607	2	017476	012869
59	982537	987118	995418	1004581	1	017462	012881
60	982551	987107	995443	1004556	0	017448	012892
	Sine Comple.	Sine.	Tangent Comple.	Tang.	48		

42	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. ca
0	982551	987107	995442	1004556	60	017448	012892
1	982565	987095	995469	1004530	59	017434	012904
2	982579	987084	995494	1004505	58	017420	012915
3	982593	987073	995519	1004480	57	017406	012926
4	982607	987061	995545	1004454	56	017392	012938
5	982621	987050	995570	1004429	55	017378	012949
6	982635	987038	995596	1004403	54	017364	012961
7	982649	987027	995621	1004378	53	017350	012972
8	982663	987016	995646	1004353	52	017336	012983
9	982677	987004	995672	1004327	51	017322	012995
10	982690	986993	995697	1004302	50	017309	013006
11	982704	986981	995723	1004276	49	017295	013018
12	982718	986970	995748	1004251	48	017281	013029
13	982732	986958	995773	1004226	47	017267	013041
14	982746	986947	995799	1004200	46	017253	013052
15	982760	986935	995824	1004175	45	017239	013064
16	982774	986924	995850	1004149	44	017225	013075
17	982788	986913	995875	1004124	43	017211	013086
18	982802	986901	995900	1004099	42	017197	013098
19	982816	986890	995926	1004073	41	017183	013109
20	982830	986878	995951	1004048	40	017169	013121
21	982843	986867	995976	1004023	39	017156	013133
22	982857	986855	996002	1003997	38	017142	013144
23	982871	986843	996027	1003972	37	017128	013156
24	982885	986832	996053	1003946	36	017114	013167
25	982899	986820	996078	1003921	35	017100	013179
26	982913	986809	996103	1003896	34	017086	013190
27	982926	986797	996129	1003870	33	017073	013202
28	982940	986786	996154	1003845	32	017059	013213
29	982954	986774	996179	1003820	31	017045	013225
30	982968	986763	996205	1003794	30	017031	013236
	Sine Comple.	Sine.	Tangent Comple.	Tang.	47		

42	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of si. co.
30	982968	986763	996205	1003794	30	017031	013236
31	982982	986751	996230	1003769	29	017057	013248
32	982995	986739	996255	1003744	28	017004	013260
33	983009	986728	996281	1003718	27	016990	013271
34	983023	986716	996306	1003993	26	016976	013283
35	983037	986705	996332	1003667	25	016962	013294
36	983050	986693	996357	1003642	24	016949	013306
37	983064	986681	996382	1003617	23	016935	013318
38	983078	986670	996408	1003591	22	016921	013329
39	983092	986658	996433	1003566	21	016907	013341
40	983105	986646	996458	1003541	20	016894	013353
41	983119	986635	996484	1003515	19	016880	013364
42	983133	986623	996509	1003490	18	016866	013376
43	983146	986612	996534	1003465	17	016853	013387
44	983160	986600	996560	1003439	16	016839	013390
45	983174	986588	996585	1003414	15	016825	013411
46	983187	986577	996610	1003389	14	016812	013423
47	983201	986565	996636	1003363	13	016798	013434
48	983215	986553	996661	1003338	12	016784	013446
49	983228	986541	996686	1003313	11	016771	013458
50	983242	986530	996712	1003287	10	016757	013469
51	983256	986518	996737	1003262	9	016743	013481
52	983269	986506	996762	1003237	8	016730	013493
53	983283	986495	996788	1003211	7	016716	013503
54	983296	986483	996813	1003186	6	016703	013516
55	983310	986471	996838	1003161	5	016689	013528
56	983324	986459	996864	1003135	4	016675	013540
57	983337	986448	996889	1003110	3	016662	013551
58	983351	986436	996914	1003085	2	016648	013563
59	983364	986424	996940	1005059	1	016635	013575
60	983378	986412	996965	1003034	0	016621	013587
	Sine Comple.	Sine.	Tangent Comple.	Tang.	47		

43	Sine	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of si. co.
0	983378	986412	996965	1003034	60	016687	013587
1	983391	986400	996990	1003009	59	016608	013599
2	983405	986389	997016	1002983	58	016594	013610
3	983418	986377	997041	1002958	57	016581	013622
4	983432	986365	997066	1002933	56	016567	013634
5	983445	986353	997092	1002907	55	016554	013646
6	983459	986341	997117	1002882	54	016540	013658
7	983472	986330	997142	1002857	53	016527	013669
8	983486	986318	997168	1002831	52	016513	013681
9	983499	986306	997193	1002806	51	016500	013693
10	983513	986296	997218	1002781	50	016486	013705
11	983526	986282	997244	1002755	49	016473	013717
12	983540	986270	997269	1002730	48	016459	013729
13	983553	986259	997294	1002705	47	016446	013740
14	983567	986247	997320	1002679	46	016432	013752
15	983580	986235	997345	1002654	45	016419	013764
16	983594	986223	997370	1002629	44	016405	013776
17	983607	986211	997396	1002603	43	016392	013788
18	983620	986199	997421	1002578	42	016379	013800
19	983634	986187	997446	1002553	41	016365	013812
20	983647	986175	997471	1002528	40	016352	013824
21	983661	986163	997497	1002502	39	016338	013836
22	983674	986151	997522	1002477	38	016325	013848
23	983687	986139	997547	1002452	37	016312	013860
24	983701	986128	997573	1002426	36	016298	013871
25	983714	986116	997598	1002401	35	016285	013883
26	983727	986104	997623	1002376	34	016272	013895
27	983741	986092	997649	1002350	33	016258	013907
28	983754	986080	997674	1002325	32	016245	013919
29	983767	986068	997699	1002300	31	016232	013931
30	983781	986056	997725	1002275	30	016218	013943
	Sine Comple.	Sine.	Tangent Comple.	Tang.	46		

43	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. co.
30	983781	985050	997725	1002275	30	016218	013943
31	983794	985044	997750	1002249	29	016205	013953
32	983807	985032	997775	1002224	28	016192	013967
33	983821	985020	997800	1002199	27	016178	013979
34	983834	985008	997826	1002173	26	016165	013991
35	983847	984996	997851	1002148	25	016152	014003
36	983860	984984	997876	1002123	24	016139	014015
37	983874	984972	997902	1002097	23	016123	014027
38	983887	984960	997927	1002072	22	016112	014039
39	983900	984948	997952	1002047	21	016099	014051
40	983913	984935	997977	1002022	20	016086	014064
41	983927	984923	998003	1001996	19	016072	014076
42	983940	984911	998028	1001971	18	016059	014088
43	983953	984899	998053	1001946	17	016046	014100
44	983966	984887	998079	1001920	16	016033	014112
45	983980	984875	998104	1001895	15	016019	014124
46	983993	984863	998129	1001870	14	016006	014136
47	984006	984851	998155	1001844	13	015993	014148
48	984019	984839	998180	1001819	12	015980	014160
49	984032	984827	998205	1001794	11	015967	014172
50	984045	984815	998230	1001769	10	015954	014184
51	984059	984802	998256	1001743	9	015940	014197
52	984072	984790	998281	1001718	8	015927	014209
53	984085	984778	998306	1001693	7	015914	014221
54	984098	984768	998332	1001667	6	015901	014233
55	984111	984754	998357	1001642	5	015888	014245
56	984124	984742	998382	1001617	4	015875	014257
57	984137	984729	998407	1001592	3	015862	014270
58	984150	984717	998433	1001566	2	015849	014282
59	984164	984705	998458	1001541	1	015835	014294
60	984177	984693	998483	1001516	0	015822	014306
	Sine Comple.	Sine.	Tangent Comple.	Tang.	46		

44	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of si. co.
0	984177	985693	998483	1001516	60	015822	014306
1	984190	985681	998509	1001491	59	015809	014318
2	984203	985669	998534	1001465	58	015796	014331
3	984216	985656	998559	1001440	57	015783	014343
4	984229	985644	998584	1001415	56	015770	014355
5	984242	985632	998610	1001389	55	015757	014367
6	984255	985620	998635	1001364	54	015744	014379
7	984268	985607	998660	1001339	53	015731	014392
8	984281	985595	998685	1001314	52	015718	014404
9	984294	985583	998711	1001288	51	015705	014416
10	984307	985571	998736	1001263	50	015692	014428
11	984320	985558	998761	1001238	49	015679	014441
12	984333	984546	998787	1001212	48	015666	014453
13	984346	985534	998812	1001187	47	015653	014465
14	984359	985521	998837	1001162	46	015640	014478
15	984372	985509	998862	1001137	45	015627	014490
16	984385	985497	998888	1001111	44	015614	014502
17	984398	985484	998913	1001086	43	015601	014515
18	984411	985472	998938	1001061	42	015588	014527
19	984414	985460	998963	1001036	41	015575	014539
20	984437	985447	998989	1001010	40	015562	014552
21	984450	985435	999014	1000985	39	015549	014564
22	984463	985423	999039	1000960	38	015536	014576
23	984476	985410	999065	1000934	37	015523	014589
24	984488	985398	999090	1000909	36	015511	014601
25	984501	985386	999115	1000884	35	015498	014613
26	984514	985373	999140	1000859	34	015485	014626
27	984527	985361	999166	1000833	33	015472	014638
28	984540	985349	999191	1000808	32	015455	014650
29	984553	985336	999216	1000783	31	015446	014663
30	984566	985324	999241	1000758	30	015433	014675
	Sine Comple.	Sine.	Tangent Comple.	Tang.	45		

44	Sine.	Sine Comple.	Tang	Tangent Complem.		Com. ar. of sine.	Com. ar. of ſi. cō.
30	984566	985324	999241	1000758	30	015433	014675
31	984579	985311	999267	1000732	29	015420	014688
32	934591	985299	999292	1000707	28	015408	014700
33	984604	985286	999317	1000682	27	015395	014713
34	984617	985274	999343	1000656	26	015382	014725
35	984630	985262	999368	1000631	25	015369	014737
36	984643	985249	999393	1000606	24	015356	014750
37	984655	985237	999418	1000581	23	015344	014762
38	984668	985224	999444	1000555	22	015331	014775
39	984681	985112	999469	1000530	21	015318	014787
40	984694	985199	999494	1000505	20	015305	014800
41	984707	985187	999519	1000480	19	019292	014812
42	984719	985174	999545	1000454	18	015280	014825
43	984732	985162	999570	1000429	17	015267	014837
44	984745	985149	999595	1000404	16	015254	014850
45	984758	985137	999621	1000379	15	015241	014862
46	984770	985124	999646	1000353	14	015229	014875
47	984783	985112	999671	1000328	13	015216	014887
48	984796	985099	999696	1000303	12	015203	014900
49	984809	985087	999722	1000277	11	015190	014912
50	984821	985074	999747	1000252	10	015178	014925
51	984834	985061	999772	1000227	9	015165	014938
52	984847	985049	999797	1000202	8	015152	014950
53	984859	985036	999823	1000176	7	015140	014963
54	984872	985024	999848	1000151	6	015127	014975
55	984885	985011	999873	1000126	5	015114	014988
56	984897	984998	999898	1000101	4	015102	015001
57	984910	984986	999924	1000075	3	015089	015013
58	984923	984973	999949	1000050	2	015076	015026
59	984935	984961	999974	1000025	1	015064	015038
60	984948	984948	100000	1000000	0	015051	015051
	Sine Comple.	Sine.	Tangent Comple.	Tang.	45		

How to examine the truth of the foregoing Canon *of* Sines *and* Tangents.

TO the Sign of any Degree and Minute add its Complement Arithmetical, and the Sum of them ſhall be 999999, or rather 1000000. Alſo, if to the Tangent of any Degree and Minute you add its Complement, the Sum ſhall be 1999999, or rather 2000000, but an Unites difference in the laſt place is not at all material. Thus if you doubt of the truth of any number in the *Canon*, you may by this Rule eaſily diſcover it; or if any Figure do not appear, this Rule will tell you what Figure it ſhould be.

A

CHILIAD,

OR, THE

LOGARITHMS

OF

Abſolute Numbers, from One to 1000.

Num	Logar.	Num	Logar.	Num	Logar.	Num	Logar.
1	000000	34	153147	67	182607	100	200000
2	030103	35	154406	68	183250	101	200432
3	047712	36	155630	69	183884	102	200860
4	060206	37	156820	70	184509	103	201283
5	069897	38	157978	71	185125	104	201703
6	077815	39	159106	72	185733	105	202118
7	084509	40	160206	73	186332	106	202530
8	090309	41	161278	74	186923	107	202938
9	095424	42	162324	75	187506	108	203342
10	100000	43	163346	76	188081	109	203742
11	104139	44	164345	77	188649	110	204139
12	107918	45	165321	78	189209	111	204532
13	111394	46	166276	79	189762	112	204921
14	114612	47	167209	80	190309	113	205307
15	117609	48	168124	81	190848	114	205690
16	120412	49	169019	82	191381	115	206069
17	123044	50	169897	83	191907	116	206445
18	125527	51	170757	84	192427	117	206818
19	127875	52	171600	85	192941	118	207188
20	130103	53	172427	86	193449	119	207554
21	132221	54	173236	87	193951	120	207918
22	134242	55	174039	88	194448	121	208278
23	136172	56	174818	89	194939	122	208635
24	138021	57	175587	90	195424	123	208990
25	139794	58	176342	91	195904	124	209342
26	141497	59	177085	92	196378	125	209691
27	143136	60	177815	93	196848	126	210037
28	144715	61	178582	94	197312	127	210380
29	146239	62	179239	95	197772	128	210720
30	147712	63	179934	96	198227	129	211058
31	149136	64	180618	97	198677	130	211394
32	140515	65	181291	98	199122	131	211727
33	151851	66	181954	99	199563	132	212057

Num	Logar.	Num	Logar.	Num	Logar.	Num	Logar.
133	212385	166	222010	199	229885	232	236548
134	212710	167	222271	200	230103	233	236735
135	213033	168	222530	201	230319	234	236921
136	213353	169	222788	202	230535	235	237106
137	213672	170	223044	203	230749	236	237291
138	213987	171	223299	204	230963	237	237474
139	214301	172	223552	205	231175	238	237657
140	214612	173	223804	206	231386	239	237839
141	214921	174	224054	207	231397	240	238021
142	215228	275	224303	208	231806	241	238201
143	215533	176	224551	209	231014	242	238381
144	215836	177	224797	210	232221	243	238560
145	216136	178	225042	211	232428	244	238738
146	216435	279	225285	212	232633	245	238916
147	216731	180	225527	213	232837	246	239093
148	217026	181	225767	214	233041	247	239269
149	217318	182	226007	215	233243	248	239445
150	217609	183	226245	216	233445	249	239619
151	217897	184	226481	217	233645	250	239794
152	218184	185	226717	218	233845	251	239967
153	218469	186	226951	219	234044	252	240140
154	218752	187	227184	220	234241	253	240312
155	219033	188	227415	221	234439	254	240483
156	219312	189	227646	222	234635	255	240654
157	219589	190	227875	223	234830	256	240824
158	219865	191	228103	224	235024	257	240993
159	220139	192	228330	225	235218	258	241161
160	220412	193	228555	226	235410	259	241329
161	220682	194	228780	227	235602	260	241497
162	220951	195	229003	228	235793	261	241664
163	221218	196	229225	229	235983	262	241830
164	221484	197	229446	230	236172	263	241995
165	221748	198	229666	231	236361	264	242160

Num.	Logar.	Num.	Logar.	Num.	Logar.	Num.	Logar.
265	242324	298	247421	331	251982	364	256119
266	242488	299	247565	332	252113	365	256229
267	242651	300	247712	333	252244	366	256348
268	242813	301	247856	334	252374	367	256466
269	242975	302	248000	335	252504	368	256584
270	243136	303	248144	336	252633	369	256702
271	243296	304	248287	337	252762	370	256820
272	243456	305	248429	338	252891	371	256937
273	243616	306	248572	339	253019	372	257054
274	243775	307	248713	340	253147	373	257170
275	243933	308	248855	341	253275	374	257287
276	244090	309	248995	342	253402	375	257403
277	244247	310	249136	343	253529	376	257518
278	244404	311	249276	344	253655	377	257634
279	244560	312	249415	345	253781	378	257749
280	244715	313	249554	346	253907	379	257863
281	244870	314	249692	347	254032	380	257978
282	245024	315	249831	348	254157	381	258092
283	245179	316	249968	349	254282	382	258206
284	245331	317	250105	350	254406	383	258319
285	245484	318	250242	351	254530	384	258433
286	245636	319	250379	352	254654	385	258546
287	245788	320	250515	353	254777	386	258658
288	245939	321	250650	354	254900	387	258771
289	246089	322	250785	355	255022	388	258883
290	246239	323	250920	356	255145	389	258994
291	246389	324	251054	357	255266	390	259106
292	246538	325	251188	358	255388	391	259217
293	246686	326	251321	359	255509	392	259328
294	246834	327	251454	360	255630	393	259439
295	246982	328	251587	361	255750	394	259549
296	247129	329	251719	362	255870	395	259659
297	247275	330	251851	363	255990	396	259769

Num	Logar.	Num	Logar.	Num	Logar.	Num	Logar.
397	2598 79	430	263346	463	266558	496	269548
398	2599 88	431	263447	464	266651	497	269635
399	2600 97	432	263548	465	266745	498	269722
400	2602 06	433	263648	466	266838	499	269810
401	2603 14	434	263748	467	266931	500	269897
402	2604 22	435	263848	468	267023	501	269983
403	2605 30	436	263948	469	267117	502	270070
404	2606 38	437	264048	470	267209	503	270156
405	2607 45	438	264147	471	267302	504	270243
406	2608 52	439	264246	472	267394	505	270329
407	2609 59	440	264345	473	267486	506	270415
408	2610 66	441	264443	474	267577	507	270500
409	2611 72	442	264542	475	267669	508	270586
410	2612 78	443	264640	476	267760	509	270671
411	2613 84	444	264738	477	267851	510	270757
412	2614 89	445	264836	478	267942	511	270842
413	2615 95	446	264933	479	268033	512	270926
414	2617 00	447	265030	480	268124	513	271011
415	2618 04	448	265127	481	268214	514	271096
416	2619 09	449	265224	482	268304	515	271180
417	2620 13	450	265321	483	268394	516	271264
418	2621 17	451	265417	484	268484	517	271349
419	2622 21	452	265513	485	268574	518	271432
420	2623 24	453	265609	486	268663	519	271516
421	2624 28	454	265705	487	268752	520	271600
422	2625 31	455	265801	488	268841	521	271683
423	2626 34	456	265896	489	268930	522	271767
424	2627 36	457	265991	490	269019	523	271850
425	2628 38	458	266086	491	269108	524	271933
426	2629 40	459	266181	492	269196	525	272015
427	2630 42	460	266275	493	269284	526	272098
428	2631 40	461	266370	494	269372	527	272181
429	2632 45	462	266464	495	269460	528	272263

Num	Logar.	Num	Logar.	Num	Logar.	Num	Logar.
529	272345	562	274973	595	277451	628	279765
530	272427	563	275050	596	277524	629	279865
531	272509	564	275127	597	277597	630	279934
532	272591	565	275204	598	277670	631	280002
533	272672	566	275281	595	277742	632	280071
534	272754	567	275358	600	277815	633	280140
535	272835	568	275434	601	277887	634	280208
536	272916	569	275511	602	277959	635	280277
537	272997	570	275587	603	278031	636	280345
538	273078	571	275663	604	278102	637	280413
539	273158	572	275739	605	278115	638	280482
540	273239	573	275815	606	278247	639	280550
541	273319	574	275891	607	278318	640	280618
542	273399	575	275966	608	278390	641	280685
543	273479	576	276042	609	278461	642	280753
544	273559	577	276117	610	278532	643	280821
545	273639	578	276192	611	278604	644	280888
546	273719	579	276267	612	278675	645	280955
547	273798	580	276342	613	278746	646	281023
548	273878	581	276417	614	278816	647	281090
549	273957	582	276492	615	278887	648	281157
550	274036	583	276569	616	278958	649	281224
551	274115	584	276641	617	279028	650	281291
552	274193	585	276715	618	279098	651	281358
553	274272	586	276789	619	279169	652	281424
554	274350	587	276863	620	279239	653	281491
555	274429	588	276937	621	279309	654	281557
556	274507	589	277011	622	279379	655	281624
557	274585	590	277085	623	279448	656	281690
558	274663	591	277158	624	279518	657	281756
559	274741	592	277232	625	279588	658	281822
560	274818	593	277305	626	279658	659	281888
561	274896	594	277378	627	279727	660	281954

Num	Logar.	Num	Logar.	Num	Logar.	Num	Logar.
661	282020	694	284135	727	286153	760	288081
662	282085	695	284198	728	286213	761	288138
663	282151	696	284260	729	286272	762	288195
664	282216	697	284323	730	286332	763	288252
665	282282	698	284385	731	286391	764	288309
666	282347	699	284447	732	286451	765	288366
667	282412	700	284509	733	286510	766	288423
668	282477	701	284571	734	286569	767	288439
669	282542	702	284633	735	286628	768	288536
670	282607	703	284695	736	286687	769	288592
671	282672	704	284757	737	286746	770	288649
672	282736	705	284818	738	286805	771	288705
673	282801	706	284880	739	286864	772	288761
674	282865	707	284941	740	286923	773	288817
675	282930	708	285003	741	286981	774	288874
676	282994	709	285064	74	287040	775	288930
677	283058	710	285125	743	287098	776	288986
678	283122	711	285186	744	287157	777	289042
679	283186	712	285248	745	287215	778	289097
680	283250	713	285308	746	287273	779	289153
681	283314	714	285369	747	287332	780	289209
682	283378	715	285430	748	287390	781	289265
683	283442	716	285491	749	287448	782	289320
684	283505	717	285551	750	287506	783	289376
685	283569	718	285612	751	287563	784	289431
686	283632	719	285672	752	287621	785	289486
687	283695	720	285733	753	287679	786	289542
688	283758	721	285793	754	287737	787	289597
689	283821	722	285853	755	287794	788	289652
690	283884	723	285913	756	287852	789	289707
691	283947	724	285973	757	287909	790	289762
692	284010	725	286033	758	287966	791	289817
693	284072	726	286093	759	288024	792	289872

Num	Logar.	Num	Logar.	Num	Logar.	Num	Logar.
793	289917	826	291698	859	293399	892	295036
794	289982	827	291750	860	293449	893	295085
795	290036	828	291803	861	293500	894	295133
796	290091	829	291855	862	293550	895	295182
797	290145	830	291907	863	293601	896	295230
798	290200	831	291960	864	293651	897	295279
799	290254	832	292012	865	293701	898	295327
800	290309	833	292064	866	293751	899	295375
801	290363	834	292116	867	293801	900	295424
802	290417	835	292168	868	293851	901	295472
803	290471	836	292220	869	293901	902	295520
804	290525	837	292272	870	293951	983	295568
805	290579	838	292324	871	294001	904	295616
806	290633	839	292376	872	294051	905	295664
807	290687	840	292427	873	294101	906	295712
808	290741	841	292479	874	294151	907	295760
809	290794	842	292531	875	294200	908	295808
810	290848	843	292582	876	294250	909	295856
811	290902	844	292634	877	294299	910	295904
812	290955	845	292685	878	294349	911	295951
813	291009	846	292737	879	294398	912	295999
814	291062	847	292788	880	294448	913	296047
815	291115	848	292839	881	294497	914	296094
816	291169	849	292890	882	294546	915	296142
817	291222	850	292941	883	294596	916	296189
818	291275	851	292992	884	294645	917	296236
819	291328	852	293043	885	294694	918	296284
820	291381	853	293094	886	294743	919	296331
821	291434	854	293145	887	294792	920	296378
822	291487	855	293196	888	294841	921	296425
823	291539	856	293247	889	294890	922	296473
824	291592	857	293298	890	294939	923	296520
825	291645	858	293348	891	294987	924	296567

Num	Logar.	Num	Logar.	Num	Logar.	Num	Logar.
925	296614	944	297497	963	298362	982	29921
926	296661	945	297543	964	298407	983	29925
927	296707	946	297589	965	298452	984	29929
928	296754	947	297635	966	298497	985	29934
929	296801	948	297680	967	298542	986	29938
930	296848	949	297726	968	298587	987	29943
931	296894	950	297772	969	298632	988	29947
932	296941	951	297818	970	298677	989	29951
933	296988	952	297863	971	298721	990	29956
934	297034	953	297909	972	298766	991	29960
935	297081	954	297954	973	298811	992	29965
936	297127	955	298000	974	298855	993	29969
937	297173	956	298045	975	298900	994	29973
938	297220	957	298091	976	298944	995	29978
939	297266	958	298136	977	298989	996	29982
940	297312	959	298181	978	299033	997	29986
941	297358	960	298227	979	299078	998	29991
942	297405	961	298272	980	299122	999	29995
943	297451	962	298317	981	299166	1000	30000

Here follow

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Certain Neceſſary

TABLES

USEFUL

In the Art

OF

NAVIGATION.

A Table of Meridional parts.

Latit.		Lat.		Lat.		Lat.	
D.	M.	parts.	D.	parts.	D.	parts.	D.	parts.
0	00	0000	5	0300	10	0603	15	0910
	10	0010		0310		0613		0921
	20	0020		0320		0623		0931
	30	0030		0330		0633		0941
	40	0040		0340		0644		0952
	50	0050		0350		0654		0962
1	00	0060	6	0360	11	0664	16	0972
	10	0070		0371		0674		0983
	20	0080		0381		0684		0993
	30	0090		0391		0694		1004
	40	0100		0401		0705		1014
	50	0110		0411		0715		1025
2	00	0120	7	0421	12	0725	17	1035
	10	0130		0431		0735		1046
	20	0140		0441		0746		1056
	30	0150		0451		0756		1067
	40	0160		0461		0766		1077
	50	0170		0471		0776		1087
3	00	0180	8	0481	13	0787	18	1098
	10	0190		0491		0797		1109
	20	0200		0502		0807		1119
	30	0210		0512		0817		1130
	40	0220		0522		0828		1140
	50	0230		0532		0838		1151
4	00	0240	9	0542	14	0848	19	1161
	10	0250		0552		0859		1172
	20	0260		0562		0869		1183
	30	0270		0572		0879		1193
	40	0280		0583		0890		1204
	50	0290		0593		0900		1214
5	00	0300	10	0603	15	0910	20	1225

Latit.		lat.		lat.		lat.		
D.	M.	parts.	D.	parts.	D.	parts.	D.	parts.
20	00	1225	25	1550	30	1888	35	2244
	10	1236		1561		1900		2256
	20	1246		1572		1911		2269
	30	1257		1583		1923		2281
	40	1268		1594		1935		2293
	50	1278		1605		1946		2306
21	00	1289	26	1616	31	1958	36	2318
	10	1300		1628		1970		2330
	20	1311		1639		1981		2343
	30	1321		1650		1993		2355
	40	1332		1661		2005		2368
	50	1343		1672		2017		2380
22	00	1354	27	1683	32	2028	37	2392
	10	1364		1691		2040		2405
	20	1375		1706		2052		2418
	30	1386		1717		2064		2430
	40	1397		1728		2076		2443
	50	1408		1740		2088		2456
23	00	1419	28	1751	33	2000	38	2468
	10	1430		1762		2111		2481
	20	1440		1774		2123		2494
	30	1451		1785		2135		2506
	40	1462		1797		2147		2519
	50	1473		1808		2159		2532
24	00	1484	29	1819	34	2171	39	2545
	10	1495		1831		2183		2558
	20	1506		1842		2196		2571
	30	1517		1854		2208		2584
	40	1528		1865		2220		2597
	50	1539		1877		2232		2610
25	00	1550	30	1888	35	2244	40	2623

Latit		lat.		lat.		lat.	
D.	M.	parts.	D.	parts.	D.	parts.	D.	parts.
40	00	2623	45	3030	50	3475	55	3968
	10	2636		3044		3490		3986
	20	2649		3056		3506		4003
	30	2662		3073		3521		4021
	40	2675		3087		3537		4038
	50	2688		3101		3553		4056
41	00	2701	46	3116	51	3569	56	4074
	10	2715		3130		3585		4092
	20	2728		3144		3601		4110
	30	2741		3160		3617		4128
	40	2755		3173		3633		4146
	50	2768		3188		3649		4164
42	00	2782	47	3203	52	3665	57	4183
	10	2795		3218		3682		4201
	20	2809		3232		3698		4220
	30	2822		3247		3714		4238
	40	2836		3262		3731		4257
	50	2849		3277		3747		4276
43	00	2863	48	3292	53	3764	58	4294
	10	2877		3307		3780		4313
	20	2890		3322		3797		4332
	30	2904		3337		3814		4352
	40	2918		3352		3831		4371
	50	2936		3367		3848		4390
44	00	2942	49	3382	54	3865	59	4409
	10	2960		3397		3882		4429
	20	2974		3413		3900		4448
	30	2988		3428		3917		4468
	40	3002		3443		3933		4488
	50	3016		3459		3951		4408
45	00	3030	50	3475	55	3968	60	4528

Latit			lat.		lat.		lat.	
D.	M.	parts.	D.	parts.	D.	parts.	D.	parts.
60	00	4528	65	5179	70	5967	75	6971
	10	4548		5203		5996		7010
	20	4568		5227		6026		7050
	30	4588		5251		6055		7090
	40	4608		5275		6085		7130
	50	4629		5299		6116		7170
61	00	4649	66	5324	71	6146	76	7211
	10	4670		5349		6177		7253
	20	4691		5373		6208		7295
	30	4712		5398		6240		7338
	40	4733		5424		6271		7381
	50	4754		5449		6303		7424
62	00	4775	67	5474	72	6336	77	7469
	10	4797		5500		6368		7513
	20	4818		5526		6401		7559
	30	4840		5552		6434		7605
	40	4861		5578		6468		7651
	50	4883		5605		6501		7698
63	00	4905	68	5631	73	6535	78	7746
	10	4927		5658		6570		7795
	20	4950		5685		6604		7844
	30	4972		5712		6639		7894
	40	14914		5740		6645		7944
	50	5097		5767		6711		7995
64	00	5040	69	5795	74	6747	79	8047
	10	5063		5823		6783		8100
	20	5086		5851		6820		8154
	30	5109		5880		6857		8208
	40	5132		5909		6895		8264
	50	5156		5937		6933		8320
65	00	5179	70	5967	75	6971	80	8377

	D	Dep.	Lat.			D	Dep.	Lat.	
1	1	0 049	0 998		1 1/4	1	0 242	0 970	
1/4	2	0 098	1 997			2	0 485	1 940	
	3	0 147	2 996			3	0 728	2 910	
	4	0 196	3 995			4	0 971	3 880	
	5	0 245	4 994			5	1 214	4 850	
	6	0 294	5 992			6	1 457	5 820	
	7	0 345	6 991			7	1 700	6 790	
	8	0 392	7 990			8	1 943	7 760	
	9	0 441	8 989			9	2 186	8 730	
	10	0 490	9 987	7 3/4		10	2 429	9 700	6 3/4
1	1	0 098	0 995		1 1/2	1	0 290	0 956	
1/2	2	0 196	1 990			2	0 580	1 913	
	3	0 294	2 985			3	0 870	2 870	
	4	0 392	3 980			4	1 161	3 827	
	5	0 490	4 975			5	1 450	4 784	
	6	0 588	5 971			6	1 741	5 781	
	7	0 686	6 966			7	2 031	6 698	
	8	0 784	7 961			8	2 322	7 655	
	9	0 882	8 956			9	2 612	8 612	
	10	0 980	9 951	7 1/2		10	2 902	9 569	6 1/2
3/4	1	0 146	0 989		1 3/4	1	0 336	0 941	
	2	0 293	1 978			2	0 673	1 883	
	3	0 440	2 967			3	1 010	2 824	
	4	0 586	3 956			4	1 347	3 766	
	5	0 733	4 945			5	1 684	4 707	
	6	0 880	5 935			6	2 021	5 649	
	7	1 027	6 924			7	2 358	6 590	
	8	1 173	7 913			8	2 695	7 532	
	9	1 320	8 902			9	3 032	8 473	
	10	1 467	9 891	7 1/4		10	3 368	9 415	6 1/4
1p	1	0 195	0 980		2p	1	0 382	0 923	
	2	0 390	1 961			2	0 765	1 847	
	3	0 585	2 942			3	1 148	2 771	
	4	0 780	3 923			4	1 530	3 695	
	5	0 975	4 903			5	1 913	4 619	
	6	1 170	5 884			6	2 296	5 543	
	7	1 365	6 865			7	2 678	6 467	
	8	1 560	7 846			8	3 061	7 391	
	9	1 755	8 827			9	3 444	8 314	
	10	1 950	9 807	7p		10	3 826	9 238	6p
		Lat.	Dep.				Lat.	Dep.	

	D.	Dep.	Lat.			D.	Dep.	Lat.	
2¼	1	0427	0 903		3¼	1	0595	0 803	
	2	0855	1 807			2	1191	1 606	
	3	1282	2 711			3	1787	2 409	
	4	1710	3 615			4	2382	3 212	
	5	2137	4 519			5	2978	4 016	
	6	2562	5 423			6	3574	4 819	
	7	2992	6 327			7	4169	5 622	
	8	3420	7 231			8	4765	6 425	
	9	3847	8 135			9	5361	7 228	
	10	4275	9 039	5¾		10	5956	8 032	4¾
2½	1	0471	0 881		3½	1	0634	0 773	
	2	0942	1 763			2	1268	1 546	
	3	1414	2 645			3	1903	2 319	
	4	1885	3 527			4	2537	3 092	
	5	2356	4 409			5	3171	3 865	
	6	2828	5 291			6	3806	4 638	
	7	3299	6 173			7	4441	5 411	
	8	3771	7 055			8	5075	6 184	
	9	4242	8 937			9	5709	6 957	
	10	4713	9 819	5½		10	6343	7 730	4½
2¾	1	0514	0 857		3¾	1	0671	0 740	
	2	1028	1 715			2	1343	1 481	
	3	1542	2 573			3	2014	2 222	
	4	2056	3 430			4	2686	2 963	
	5	2570	4 288			5	3357	3 704	
	6	3084	5 146			6	4029	4 445	
	7	3598	6 004			7	4700	5 185	
	8	4112	7 861			8	5372	5 926	
	9	4626	8 719			9	6044	6 667	
	10	5141	9 577	5¼		10	6715	7 408	4¼
3P	1	0555	0 831		4P	1	0707	0 727	
	2	1111	1 662			2	1414	1 414	
	3	1666	2 494			3	2121	2 121	
	4	2222	3 325			4	2828	2 828	
	5	2777	4 157			5	3535	3 535	
	6	3333	4 988			6	4242	4 242	
	7	3888	5 820			7	4949	4 949	
	8	4444	6 651			8	5656	5 656	
	9	5000	7 483			9	6363	6 363	
	10	5555	8 314	5P		10	7071	7 071	4P
	D.	Lat.	Dep.			D.	Lat.	Dep.	

Latit.		First		Second		Third		Fourth	
gr.	m.	Long.	dif	Long.	dif	Long.	dif	Long.	dif
0	10	0 02	2	0 04	4	0 07	6	0 10	10
	20	0 04	2	0 08	4	0 13	7	0 20	10
	30	0 06	2	0 12	4	0 20	7	0 30	10
	40	0 08	2	0 16	4	0 27	6	0 40	10
	50	0 10	2	0 20	5	0 33	7	0 50	10
1	00	0 12	2	0 25	4	0 40	7	1 00	10
	10	0 14	2	0 29	4	0 47	6	1 10	10
	20	0 16	2	0 33	4	0 53	7	1 20	10
	30	0 18	2	0 37	4	1 00	7	1 30	10
	40	0 20	2	0 41	4	1 07	6	1 40	10
	50	0 22	2	0 45	5	1 13	7	1 50	10
2	00	0 24	2	0 50	4	1 20	7	2 00	10
	10	0 26	2	0 54	4	1 27	6	2 10	10
	20	0 28	2	0 58	4	1 33	7	2 20	10
	30	0 30	2	1 02	4	1 40	7	2 30	10
	40	0 32	2	1 06	4	1 47	6	2 40	10
	50	0 34	2	1 10	5	1 53	7	2 50	10
3	00	0 36	2	1 15	4	2 00	7	3 00	10
	10	0 38	2	1 19	4	2 07	6	3 10	10
	20	0 40	2	1 23	4	2 13	7	3 20	10
	30	0 42	2	1 27	4	2 20	7	3 30	10
	40	0 44	2	1 31	4	2 27	6	3 40	10
	50	0 46	2	1 35	4	2 33	7	3 50	10
4	00	0 48	2	1 39	4	2 40	7	4 00	10
	10	0 50	2	1 43	5	2 47	7	4 10	10
	20	0 52	2	1 48	4	2 54	6	4 20	10
	30	0 54	2	1 52	4	3 00	7	4 30	10
	40	0 56	2	1 56	4	3 07	7	4 40	10
	50	0 58	2	2 00	4	3 14	7	4 50	10
5	00	1 00	2	2 04	4	3 21	6	5 00	10

Latit.		Fifth			Sixth			Seventh		
gr.	m.	Long.		dif	Long.		dif	Long.		dif
0	10	00	15	15	00	24	24	00	50	50
	20	00	30	15	00	48	24	01	40	50
	30	00	45	15	01	12	24	02	31	50
	40	01	00	15	01	36	24	03	21	50
	50	01	15	15	02	00	24	05	11	50
1	00	01	29	15	02	25	24	05	01	51
	10	01	44	15	02	40	24	05	52	50
	20	01	59	15	03	13	24	06	42	50
	30	02	14	15	03	37	24	07	32	50
	40	02	29	15	03	01	24	08	22	51
	50	02	44	15	04	25	25	09	13	50
2	00	02	59	15	04	50	24	10	03	51
	10	03	14	15	05	14	24	10	54	50
	20	03	29	15	05	38	24	11	44	50
	30	03	44	15	06	02	24	12	34	50
	40	03	59	15	06	26	24	13	24	51
	50	04	14	15	06	50	25	14	15	50
3	00	04	29	15	07	15	24	15	05	51
	10	04	44	15	07	39	24	15	56	50
	20	04	59	15	08	03	24	16	46	50
	30	05	14	15	08	27	24	17	36	50
	40	05	29	15	08	51	24	18	26	51
	50	05	44	15	09	15	25	19	17	50
4	00	06	00	15	09	40	24	20	07	51
	10	06	15	15	10	04	24	20	58	50
	20	06	30	15	10	29	25	21	48	51
	30	06	45	15	10	53	24	22	38	50
	40	07	00	15	11	17	24	23	29	51
	50	07	15	15	11	41	24	24	20	50
5	00	07	30	15	12	50	24	25	10	51

Latit.	First			Second			Third			Fourth		
gr.	m.	Long.	dif	Long.	dif		Long.	dif		Long.	dif	
5	10	1 02	2	2 08	4		3 27	7		5 10	10	
	20	1 04	2	2 12	4		3 34	7		5 20	10	
	30	1 06	2	2 16	4		3 41	7		5 30	10	
	40	1 08	2	2 20	5		3 48	6		5 40	10	
	50	1 10	2	2 25	4		3 54	7		5 50	10	
6	00	1 12	2	2 29	4		4 01	6		6 01	10	6
	10	1 14	2	2 33	5		4 07	7		6 11	10	
	20	1 16	2	2 38	4		4 14	7		6 21	10	
	30	1 18	2	2 42	4		4 21	7		6 31	10	
	40	1 20	2	2 46	4		4 28	6		6 41	10	
	50	1 22	2	2 50	5		4 34	7		6 50	10	
7	00	1 24	2	2 55	4		4 41	7		7 01	10	7
	10	1 26	2	2 59	4		4 48	7		7 11	10	
	20	1 28	2	3 03	4		4 55	7		7 21	10	
	30	1 30	2	3 07	4		5 02	7		7 31	10	
	40	1 32	2	3 11	4		5 09	6		7 41	10	
	50	1 34	2	3 15	4		5 15	7		7 51	10	
8	00	1 36	2	3 19	5		5 22	7		8 02	10	8
	10	1 38	2	3 24	4		5 29	7		8 12	10	
	20	1 40	2	3 28	4		5 36	6		8 22	10	
	30	1 42	2	3 32	4		5 42	7		8 32	10	
	40	1 44	2	3 36	4		5 49	6		8 42	10	
	50	1 46	2	3 40	4		5 55	7		8 52	10	
9	00	1 48	2	3 44	5		6 02	7		9 02	10	9
	10	1 50	2	3 49	4		6 09	7		9 12	10	
	20	1 52	2	3 53	4		6 16	7		9 22	10	
	30	1 54	2	3 57	4		6 23	7		9 33	10	
	40	1 56	2	4 01	5		6 30	6		9 43	10	
	50	1 58	2	4 06	4		6 36	7		9 53	10	
10	00	2 00	2	4 10	4		6 43	7		10 03	10	10

Lat. t.		Fifth			Sixth			Seventh		
gr.	m.	Long.		dif	Long.		dif	Long.		dif
5	10	07	45	15	12	29	24	26	01	50
	20	08	00	15	12	53	25	26	51	50
	30	08	15	15	13	18	24	27	41	51
	40	08	30	15	13	42	24	28	32	51
	50	08	45	15	14	06	25	29	23	50
6	00	09	00	15	14	31	24	30	13	51
	10	09	15	15	14	55	24	31	04	50
	20	09	30	15	15	19	25	31	54	51
	30	09	45	15	15	44	24	32	45	50
	40	10	00	15	16	08	24	33	35	50
	50	10	15	15	16	32	24	34	25	51
7	00	10	30	15	16	56	24	35	16	51
	10	10	45	15	17	20	24	36	07	51
	20	11	00	15	17	44	25	36	58	51
	30	11	15	15	18	09	24	37	49	50
	40	11	30	15	08	33	24	38	39	50
	50	11	45	16	18	57	25	39	29	51
8	00	12	01	15	19	22	24	40	20	51
	10	12	16	15	19	46	25	41	11	51
	20	12	31	15	20	11	25	42	02	51
	30	12	46	15	20	36	24	42	53	50
	40	13	01	15	21	00	24	43	43	51
	50	13	16	15	21	24	25	44	34	51
9	00	13	31	15	21	49	24	45	25	51
	10	13	46	15	22	13	24	46	16	51
	20	14	01	15	22	37	25	47	07	51
	30	14	16	16	23	02	24	47	58	51
	40	14	32	15	23	26	25	48	49	51
	50	14	47	15	23	51	25	49	40	51
10	00	15	02	15	24	16	24	50	31	51

Latit.		First.		Second		Third.		Fourth	
gr.	m.	Long.	dif	Long.	dif	Long.	dif	Long.	dif
10	10	2 02	2	4 14	4	6 50	7	10 13	10
	20	2 04	2	4 18	4	6 57	6	10 23	11
	30	2 06	2	4 22	4	7 03	7	10 34	10
	40	2 08	2	4 26	5	7 10	7	10 44	10
	50	2 10	2	4 31	4	7 17	6	10 54	10
11	00	2 12	2	4 35	4	7 23	7	11 04	10
	10	2 14	2	4 39	4	7 30	7	11 14	10
	20	2 16	2	4 43	5	7 37	7	11 24	11
	30	2 18	2	4 48	4	7 44	7	11 35	10
	40	2 20	2	4 52	4	7 51	7	11 45	10
	50	2 22	2	4 56	5	7 58	6	11 55	10
12	00	2 24	2	5 01	4	8 04	7	12 05	10
	10	2 26	2	5 05	4	8 11	7	12 15	10
	20	2 28	2	5 09	4	8 18	7	12 25	11
	30	2 30	2	5 13	5	8 25	7	12 36	10
	40	2 32	2	5 18	4	8 32	7	12 46	10
	50	2 34	2	5 22	4	8 39	7	12 56	11
13	00	2 37	2	5 26	4	8 46	6	13 07	10
	10	2 39	2	5 30	4	8 52	7	13 17	10
	20	2 41	2	5 34	4	8 59	7	13 27	11
	30	2 43	2	5 38	5	9 06	7	13 38	10
	40	2 45	2	5 43	4	9 13	7	13 48	10
	50	2 47	2	5 47	4	9 20	7	13 58	10
14	00	2 49	2	5 51	4	9 27	7	14 08	10
	10	2 51	2	5 55	5	9 34	7	14 18	10
	20	2 53	2	6 00	4	9 41	7	14 28	11
	30	2 55	2	6 04	4	9 48	6	14 39	10
	40	2 57	2	6 08	5	9 54	7	14 49	10
	50	2 59	2	6 13	4	10 01	7	14 59	11
15	00	3 01	2	6 17	4	10 08	7	15 10	10

Latit.		Fifth		dif	Sixth		dif	Seventh		dif
gr.	m.	Long.			Long.			Long.		
10	10	15	17	15	24	40	24	51	22	52
	20	15	32	16	25	04	25	52	14	51
	30	15	48	15	25	29	24	53	05	51
	40	16	03	15	25	53	25	53	56	51
	50	16	18	16	26	18	25	54	47	51
11	00	16	34	15	26	43	24	55	38	51
	10	16	49	16	27	07	25	56	29	51
	20	17	05	15	27	32	25	57	20	52
	30	17	20	15	27	57	24	58	12	51
	40	17	35	15	28	21	24	59	03	51
	50	17	50	15	28	45	25	59	54	52
12	00	18	05	15	29	10	25	60	46	51
	10	18	20	15	29	35	25	61	37	51
	20	18	35	16	30	00	25	62	28	52
	30	18	51	15	30	25	24	63	20	51
	40	19	06	15	30	49	25	64	11	52
	50	19	21	16	31	14	25	65	03	52
13	00	19	37	15	31	39	25	65	55	52
	10	19	52	16	32	04	25	66	47	51
	20	20	08	15	32	29	25	67	38	52
	30	20	23	15	32	54	24	68	30	51
	40	20	38	16	33	18	25	69	21	52
	50	20	54	16	33	43	25	70	13	52
14	00	21	10	15	34	08	25	71	05	52
	10	21	25	15	34	33	25	71	57	52
	20	21	40	16	34	58	25	72	49	52
	30	21	56	15	35	23	25	73	41	52
	40	22	11	15	35	48	25	74	33	52
	50	22	26	16	36	13	25	75	25	52
15	00	22	42	15	36	38	25	76	17	52

Latit.		First		Second		Third		Fourth	
gr.	m.	Long.	dif	Long.	dif	Long.	dif	Long.	dif
15	10	3 03	2	6 21	5	10 15	7	15 20	10
	20	3 05	2	6 26	4	10 22	7	15 30	11
	30	3 07	2	6 30	4	10 29	7	15 41	10
	40	3 09	2	6 34	5	10 36	7	15 51	11
	50	3 11	2	6 39	4	10 43	7	16 02	11
16	00	3 13	2	6 43	4	10 50	7	16 13	10
	10	3 15	2	6 47	4	10 57	7	16 22	10
	20	3 17	2	6 51	5	11 04	7	16 33	11
	30	3 19	3	6 56	4	11 11	7	16 44	10
	40	3 22	2	7 00	4	11 18	7	16 54	10
	50	3 24	2	7 04	4	11 25	7	17 04	11
17	00	3 26	2	7 08	5	11 32	7	17 15	10
	10	3 28	2	7 13	4	11 39	7	17 25	10
	20	3 30	2	7 17	4	11 46	7	17 35	11
	30	3 32	2	7 21	5	11 5	7	17 46	10
	40	3 34	2	7 26	4	12 00	7	17 56	11
	50	3 36	2	7 30	5	12 07	7	18 07	11
18	00	3 38	2	7 35	4	12 14	7	18 18	10
	10	3 40	2	7 39	4	12 21	7	18 28	11
	20	3 42	2	7 43	4	12 28	7	18 39	11
	30	3 44	2	7 47	5	12 35	7	18 50	10
	40	3 46	3	7 52	5	12 42	7	19 00	10
	50	3 49	2	7 57	4	12 49	7	19 10	11
19	00	3 51	2	8 01	4	12 56	7	19 21	10
	10	3 53	2	8 05	5	13 03	7	19 31	11
	20	3 55	2	8 10	4	13 10	7	19 42	11
	30	3 57	2	8 14	4	13 17	7	19 53	10
	40	3 59	2	8 18	5	13 24	7	20 03	11
	50	4 01	2	8 23	4	13 31	7	20 14	11
20	00	4 04	2	8 27	5	13 38	7	20 25	10

Latit.		Fifth.		dif	Sixth.		dif	Seventh.		dif
d.	m.	Long			Long.			Long.		
15	10	22	57	16	37	03	25	77	09	52
	20	23	13	15	37	28	25	78	01	52
	30	23	28	16	37	53	25	78	53	52
	40	23	44	16	38	18	25	79	45	52
	50	24	00	16	38	43	25	80	37	53
16	00	24	16	15	39	08	25	81	30	52
	10	24	31	16	39	33	25	82	22	52
	20	24	47	16	39	58	26	83	14	53
	30	25	03	15	40	24	25	84	07	52
	40	25	18	15	40	49	25	84	59	53
	50	25	33	16	41	14	25	85	52	53
17	00	25	49	15	41	39	25	86	45	52
	10	26	04	16	42	04	25	87	37	52
	20	26	20	16	42	29	26	88	29	53
	30	26	36	15	42	55	25	89	22	53
	40	26	51	16	43	20	25	90	15	53
	50	27	07	16	43	45	26	91	08	53
18	00	27	23	16	44	11	25	92	01	53
	10	27	39	16	44	36	25	92	54	53
	20	27	55	16	45	01	26	93	47	53
	30	28	11	15	45	27	25	94	40	53
	40	28	26	16	45	52	26	95	33	53
	50	28	42	16	46	18	26	96	26	53
19	00	28	58	16	46	44	25	97	19	53
	10	29	14	16	47	09	26	98	12	53
	20	29	30	16	47	35	26	99	05	54
	30	29	46	15	48	01	25	99	59	53
	40	30	01	16	48	26	25	100	52	53
	50	30	17	16	48	51	26	101	45	53
20	00	30	33	16	49	17	26	102	38	54

Latit.		First		Second		Third		Fourth	
gr.	m.	Long.	dif.	Long.	dif.	Long.	dif.	Long.	dif.
20	10	4 05	3	08 32	4	13 45	7	20 35	11
	20	4 09	2	08 36	5	13 52	8	20 46	11
	30	4 11	2	08 41	5	14 00	7	20 57	10
	40	4 13	2	08 46	4	14 07	7	21 07	11
	50	4 15	2	08 50	4	14 14	7	21 18	11
21	00	4 17	2	08 54	4	14 21	7	21 29	10
	10	4 19	2	08 58	5	14 28	8	21 39	11
	20	4 21	2	09 03	5	14 36	7	21 50	11
	30	4 23	2	09 08	4	14 43	7	22 01	11
	40	4 25	2	09 12	4	14 50	7	22 12	11
	50	4 27	2	09 16	4	14 57	7	22 23	11
22	00	4 29	2	09 20	5	15 04	7	22 34	10
	10	4 31	2	09 25	5	15 11	7	22 44	11
	20	4 33	2	09 30	4	15 18	8	22 55	11
	30	4 35	2	09 34	4	15 26	7	23 06	10
	40	4 37	3	09 38	5	15 33	8	23 16	11
	50	4 40	2	09 43	4	15 41	7	23 27	11
23	00	4 42	2	09 47	5	15 48	7	23 38	11
	10	4 44	2	09 52	5	15 55	8	23 49	11
	20	4 46	2	09 57	5	16 03	7	24 00	11
	30	4 48	3	10 02	4	16 10	7	24 11	11
	40	4 51	2	10 06	4	16 17	8	24 22	11
	50	4 53	2	10 10	4	16 25	7	24 33	11
24	00	4 55	2	10 14	5	16 32	7	24 44	11
	10	4 57	2	10 19	5	16 39	7	24 55	11
	20	4 59	3	10 24	5	16 46	7	25 06	11
	30	5 02	2	10 29	4	16 53	8	25 17	11
	40	5 04	2	10 33	4	17 01	7	25 28	11
	50	5 06	2	10 37	5	17 08	8	25 39	11
25	00	5 08	2	10 42	5	17 16	7	25 50	11

dif	Latit. d	m.	Fifth Long.		dif	Sixth. Long.		dif	Seventh. Long.		dif
11	20	10	30	49	16	49	43	26	103	32	54
11		20	31	05	16	50	09	26	104	26	54
10		30	31	21	16	50	35	25	105	20	53
11		40	31	37	16	51	00	26	106	13	54
11		50	31	53	16	51	26	26	107	07	54
10	21	00	32	09	16	51	52	26	108	01	54
11		10	32	25	16	52	18	26	108	55	54
11		20	32	41	16	52	44	26	109	49	54
11		30	32	57	16	53	10	26	110	43	54
11		40	33	13	16	53	36	26	111	37	55
11		50	33	29	17	54	02	26	112	31	54
10	22	00	33	46	16	54	28	26	113	25	54
11		10	34	02	16	54	54	26	114	19	54
11		20	34	18	16	55	20	25	115	13	55
10		30	34	34	16	55	46	26	116	08	54
11		40	34	50	16	56	12	26	117	02	55
11		50	35	06	17	56	38	27	117	57	55
11	23	00	35	23	16	57	05	26	118	52	54
11		10	35	39	16	57	31	26	119	46	55
11		20	35	55	17	57	57	26	120	41	55
1		30	36	12	16	58	24	26	121	36	55
1		40	36	28	16	58	30	26	122	31	55
1		50	36	44	17	59	16	27	123	26	55
1	24	00	37	01	16	59	43	26	124	21	55
1		10	37	17	16	60	09	26	125	16	55
1		20	37	33	17	60	35	27	126	11	55
1		30	37	50	16	61	02	26	127	06	55
1		40	38	06	17	61	28	27	128	01	55
1		50	38	23	17	61	55	27	128	56	56
	25	00	38	40	16	62	22	26	129	52	55

Latit.		First.		Second			Third			Fourth		
gr.	m.	Long.	dif	Long.		dif	Long.		dif	Long.		dif
25	10	5	10	2	10	47	4	17	23	7	26	01	11
	20	5	12	2	10	51	5	17	30	8	26	12	11
	30	5	14	3	10	56	5	17	38	7	26	23	11
	40	5	17	2	11	01	4	17	45	7	26	34	11
	50	5	19	2	11	05	5	17	52	8	26	45	11
26	00	5	21	2	11	10	4	18	00	7	26	56	11
	10	5	23	2	11	14	4	18	07	8	27	07	11
	20	5	25	2	11	18	5	18	15	8	27	18	11
	30	5	27	3	11	23	5	18	23	7	27	29	11
	40	5	30	2	11	28	5	13	30	7	27	40	11
	50	5	32	2	11	33	4	18	37	8	27	51	12
27	00	5	34	2	11	37	5	18	45	7	28	03	11
	10	5	36	3	11	42	5	18	52	7	28	14	11
	20	5	39	2	11	47	4	18	59	8	28	25	12
	30	5	41	2	11	51	5	19	07	8	28	37	11
	40	5	43	3	11	56	5	19	15	7	28	48	11
	50	5	46	2	12	01	4	19	22	8	28	59	11
28	00	5	48	2	12	05	5	19	31	7	29	11	11
	10	5	50	2	12	10	5	19	37	8	29	22	11
	20	5	52	3	12	15	5	19	45	8	29	33	12
	30	5	55	2	12	20	4	19	53	7	29	45	11
	40	5	57	3	12	24	5	20	00	8	29	56	11
	50	6	00	2	12	29	4	20	08	8	30	07	12
29	00	6	02	2	12	33	5	20	16	7	30	19	12
	10	6	04	3	12	38	5	20	23	8	30	30	11
	20	6	07	2	12	43	5	20	31	8	30	42	11
	30	6	09	2	12	48	5	20	39	7	30	54	11
	40	6	11	2	12	53	4	20	46	8	31	05	11
	50	6	13	3	12	57	5	20	54	8	31	16	12
30	00	6	16	2	13	02	5	21	02	7	31	28	11

Latit.		Fifth			Sixth.			Seventh.		
gr.	m.	Long.		dif	Long.		dif	Long.		dif
25	10	38	56	16	62	48	27	130	47	56
	20	39	12	17	63	15	27	131	43	56
	30	39	29	16	63	42	26	132	39	55
	40	39	45	17	64	08	27	133	34	56
	50	40	02	17	64	35	27	134	30	56
26	00	40	19	16	65	02	27	135	26	56
	10	40	35	17	65	29	27	136	22	56
	20	40	52	17	65	56	27	137	18	56
	30	41	09	17	66	23	27	138	14	56
	40	41	26	17	66	50	27	139	10	56
	50	41	43	17	67	17	27	140	06	57
27	00	42	00	16	67	44	27	141	03	56
	10	42	16	17	68	11	27	141	59	57
	20	42	33	17	68	38	28	142	56	57
	30	42	50	16	69	06	27	143	53	56
	40	43	06	17	69	33	27	144	49	57
	50	43	23	17	70	00	28	145	46	57
28	00	43	40	17	70	28	27	146	43	57
	10	43	57	17	70	55	27	147	40	57
	20	44	14	18	71	22	28	148	37	57
	30	44	32	17	71	50	27	149	34	57
	40	44	49	17	72	17	27	150	31	57
	50	45	06	17	72	44	28	151	28	58
29	00	45	23	17	73	12	27	152	26	58
	10	45	40	17	73	39	28	153	24	58
	20	45	57	17	74	07	28	154	22	58
	30	46	14	17	74	35	28	155	20	58
	40	46	31	17	75	03	28	156	18	58
	50	46	48	18	75	31	28	157	16	58
30	00	47	06	17	75	59	28	158	14	58

Latit.		First.			Second			Third			Fourth		
gr.	m.	Long.		dif	Long.		dif	Long.		dif	Long.		dif
30	10	6	18	2	13	07	5	25	09	8	31	39	12
	20	6	20	2	13	12	4	25	17	8	31	51	12
	30	6	22	3	13	16	5	25	25	7	32	03	11
	40	6	25	2	13	21	5	25	32	8	32	14	12
	50	6	27	2	13	26	5	25	40	8	32	26	12
31	00	6	29	3	13	31	5	25	48	8	32	38	11
	10	6	32	2	13	36	5	25	56	8	32	49	12
	20	6	34	3	13	41	5	26	04	8	33	01	12
	30	6	37	2	13	46	5	26	12	7	33	13	11
	40	6	39	2	13	51	5	26	19	8	33	24	12
	50	6	41	2	13	56	4	26	27	8	33	36	12
32	00	6	43	3	14	00	5	26	35	8	33	48	12
	10	6	46	2	14	05	5	26	43	8	34	00	12
	20	6	48	3	14	10	5	26	51	8	34	12	12
	30	6	51	2	14	15	5	26	59	8	34	24	12
	40	6	53	2	14	20	4	27	07	8	34	35	12
	50	6	55	3	14	24	5	27	15	8	34	47	12
33	00	6	58	2	14	29	5	27	23	8	34	59	12
	10	7	00	3	14	34	5	27	31	8	35	11	12
	20	7	03	2	14	39	6	27	39	8	35	23	12
	30	7	05	3	14	45	5	27	47	8	35	35	12
	40	7	08	2	14	50	5	27	55	8	35	47	12
	50	7	10	2	14	55	5	28	03	8	35	59	12
34	00	7	12	2	15	00	5	28	11	8	36	11	12
	10	7	14	3	15	05	4	28	19	8	36	23	12
	20	7	17	3	15	09	5	28	27	8	36	35	13
	30	7	20	2	15	14	5	28	35	8	36	48	12
	40	7	22	2	15	19	5	28	43	8	37	00	12
	50	7	24	2	15	24	6	28	51	9	37	12	12
35	00	7	26	3	15	30	5	29	00	8	37	24	12

Latit.		Fifth.			Sixth.			Seventh.		
gr.	m.	Long		dif	Long.		dif	Long.		dif
30	10	47	23	17	76	27	28	159	12	58
	20	47	40	18	76	55	28	160	10	58
	30	47	58	17	77	23	28	161	08	58
	40	48	15	17	77	51	28	162	06	59
	50	48	32	18	78	19	28	163	05	59
31	00	48	50	17	78	47	28	164	04	58
	10	49	07	18	79	15	28	165	02	59
	20	49	25	18	79	43	29	166	01	59
	30	49	43	17	80	12	28	167	00	59
	40	50	00	18	80	40	28	167	59	59
	50	50	18	18	81	08	29	168	58	60
32	00	50	36	17	81	37	28	169	58	59
	10	50	53	17	82	05	28	170	57	59
	20	51	10	18	82	33	29	171	56	59
	30	51	28	18	83	02	29	172	55	60
	40	51	46	18	83	31	29	173	55	60
	50	52	04	18	84	00	29	174	55	60
33	00	52	22	18	84	29	28	175	55	60
	10	52	40	18	84	57	29	176	55	60
	20	52	58	18	85	26	29	177	55	60
	30	53	16	18	85	55	29	178	55	60
	40	53	34	18	86	24	29	179	55	61
	50	53	52	18	86	53	29	180	56	61
34	00	54	10	18	87	22	29	181	57	60
	10	54	28	18	87	51	29	182	57	61
	20	54	46	18	88	20	30	183	58	61
	30	55	04	18	88	50	29	184	59	61
	40	55	22	18	89	19	29	186	00	61
	50	55	40	19	89	48	30	187	01	61
35	00	55	59	19	90	18	29	188	02	61

Latit.		First		Second		Third		Fourth	
gr	m.	Long.	dif	Long.	dif	Long.	dif	Long.	dif
35	10	7 29	2	15 35	5	25 08	8	37 36	12
	20	7 31	3	15 40	5	25 16	8	37 48	13
	30	7 34	2	15 45	5	25 24	8	38 01	12
	40	7 36	3	15 50	5	25 32	8	38 13	12
	50	7 39	2	15 55	5	25 40	9	38 25	13
36	00	7 41	2	16 00	5	25 49	8	38 38	12
	10	7 43	3	16 05	6	25 57	8	38 50	12
	20	7 46	2	16 11	5	26 05	9	39 02	13
	30	7 48	3	16 16	5	26 14	8	39 15	12
	40	7 51	2	16 21	5	26 22	8	39 27	12
	50	7 53	2	16 26	5	26 30	8	39 39	13
37	00	7 55	3	16 31	5	26 38	8	39 52	12
	10	7 58	3	16 36	5	26 46	9	49 04	13
	20	8 01	2	16 41	6	26 55	9	40 17	13
	30	8 03	3	16 47	5	27 04	8	40 30	12
	40	8 06	2	16 52	5	27 12	8	40 42	13
	50	8 08	3	16 57	5	27 20	9	40 55	13
38	00	8 11	3	17 02	5	27 29	8	41 08	12
	10	8 14	2	17 07	5	27 37	9	41 20	13
	20	8 16	3	17 12	6	27 46	9	41 33	13
	30	8 19	2	17 18	6	17 55	8	41 46	13
	40	8 21	3	17 24	5	28 03	8	41 59	13
	50	8 24	2	17 29	5	28 11	9	42 12	13
39	00	8 26	3	17 34	5	28 20	8	42 25	13
	10	8 29	2	17 39	5	28 28	9	42 38	13
	20	8 31	3	17 44	5	28 37	9	42 51	13
	30	8 34	3	17 49	6	28 46	9	43 04	13
	40	8 37	2	17 55	6	28 55	9	43 17	13
	50	8 39	3	18 01	5	29 04	9	43 30	13
40	00	8 42	2	18 06	6	29 13	8	43 43	13

Latit.		Fifth			Sixth			Seventh		
gr.	m.	Long.		dif	Long.		dif	Long.		dif
35	10	56	17	18	90	47	30	189	03	62
	20	56	35	19	91	17	30	190	05	62
	30	56	54	18	91	47	29	191	07	62
	40	57	12	18	92	16	30	192	09	62
	50	57	30	19	92	46	30	193	11	62
36	00	57	49	18	93	16	30	194	13	62
	10	58	07	19	03	46	30	195	15	62
	20	58	26	19	94	16	30	196	17	63
	30	58	45	18	94	46	30	197	20	62
	40	59	03	19	95	16	30	198	22	63
	50	59	22	19	95	46	30	199	25	63
37	00	59	41	18	96	16	30	200	28	63
	10	59	59	19	96	46	30	201	31	63
	20	60	18	19	97	16	30	202	34	63
	30	60	37	19	97	47	31	203	37	64
	40	60	56	19	98	17	30	204	41	64
	50	61	15	19	98	48	31	205	45	64
38	00	61	34	19	99	19	30	206	49	63
	10	61	53	19	99	49	31	207	52	64
	20	62	12	19	100	20	31	208	56	64
	30	62	31	19	100	51	31	210	00	64
	40	62	50	19	101	22	31	211	04	65
	50	63	09	20	101	53	31	212	09	65
39	00	63	29	19	102	24	31	213	14	64
	10	63	48	19	102	55	31	214	18	65
	20	64	07	20	103	26	31	215	23	65
	30	64	27	19	103	57	31	216	28	65
	40	64	46	19	104	28	31	217	33	66
	50	65	05	20	104	59	32	218	39	66
40	00	65	25	19	105	31	31	219	45	65

Latit.		First			Second			Third			Fourth		
gr.	m.	Long.		dif	Long.		dif	Long.		dif	Long.		dif
40	10	8	44	1	18	12	6	29	21	9	43	56	13
	20	8	47	2	18	18	5	29	30	9	44	09	13
	30	8	49	3	18	23	5	29	39	8	44	22	13
	40	8	52	2	18	28	6	29	47	9	44	35	13
	50	8	54	3	18	34	5	29	56	9	44	48	14
41	00	8	57	3	18	39	5	30	05	9	45	02	13
	10	9	00	3	18	44	6	30	14	9	45	15	13
	20	9	03	3	18	50	6	30	23	9	45	28	13
	30	9	06	2	18	56	5	30	32	9	45	41	13
	40	9	08	3	19	01	5	30	41	9	45	54	14
	50	9	11	2	19	06	6	30	50	9	46	08	14
42	00	9	13	3	19	12	6	30	59	9	46	22	13
	10	9	16	2	19	18	5	31	08	9	46	35	13
	20	9	18	3	19	23	6	31	17	9	46	48	14
	30	9	21	3	19	29	6	31	26	9	47	02	13
	40	9	24	3	19	35	5	31	35	9	47	15	14
	50	9	27	2	19	40	6	31	44	9	47	29	14
43	00	9	30	3	19	46	6	31	53	9	47	43	13
	10	9	32	3	19	52	5	32	02	9	47	56	14
	20	9	35	2	19	57	6	32	11	9	47	10	14
	30	9	37	3	20	03	6	32	20	9	48	24	14
	40	9	40	3	20	09	6	32	29	9	48	38	14
	50	9	43	3	20	15	5	32	38	10	48	52	14
44	00	9	46	2	20	20	6	32	48	9	49	06	14
	10	9	48	3	20	26	6	32	57	9	49	20	14
	20	9	51	3	20	32	6	33	06	10	49	34	14
	30	9	54	3	20	38	6	33	16	9	49	48	14
	40	9	57	3	20	44	6	33	25	9	50	02	14
	50	10	00	3	20	50	5	33	34	10	50	16	14
45	00	10	03	3	20	55	6	33	44	9	50	30	14

Latit.		Fifth			Sixth			Seventh		
gr.	m.	Long.		dif	Long.		dif	Long.		dif
40	10	65	44	20	106	02	32	220	50	66
	20	66	08	20	106	34	32	221	56	66
	30	66	24	19	107	06	32	223	02	66
	40	66	44	20	107	38	32	224	08	67
	50	67	03	20	108	10	32	225	15	67
41	00	67	23	20	108	42	32	226	22	66
	10	67	43	20	109	14	32	227	28	67
	20	68	03	20	109	46	32	228	35	67
	30	68	23	20	110	18	32	229	42	67
	40	68	43	20	110	50	32	230	49	67
	50	69	03	20	111	22	33	231	56	68
42	00	69	23	20	111	55	32	233	04	68
	10	69	43	20	112	27	33	234	12	68
	20	70	03	20	113	00	33	235	20	68
	30	70	23	20	113	33	32	236	28	68
	40	70	43	21	114	05	33	237	36	68
	50	71	04	21	114	38	33	238	44	69
43	00	71	25	20	115	11	33	239	53	69
	10	71	45	20	115	44	33	241	02	69
	20	72	05	21	116	17	34	242	11	69
	30	72	26	20	116	51	33	243	20	69
	40	72	46	21	117	24	33	244	29	70
	50	73	07	21	117	57	34	245	39	70
44	00	73	28	21	118	31	34	246	49	70
	10	73	49	21	119	05	34	247	59	70
	20	74	10	21	119	39	34	249	09	70
	30	74	31	20	120	13	34	250	19	71
	40	74	51	21	120	47	34	251	30	71
	50	75	12	22	121	21	34	252	41	71
45	00	75	34	21	121	55	34	253	52	71

Latit.		First.		Second		Third.		Fourth		
gr.	m.	Long.	dif	Long.	dif	Long.	dif	Long.		dif
45	10	10 06	2	21 01	6	33 53	10	50 44		14
	20	10 08	3	21 07	6	34 03	10	50 58		14
	30	10 11	3	21 13	6	34 13	09	51 12		14
	40	10 14	3	21 19	5	34 22	09	51 26		15
	50	10 17	3	21 24	6	34 31	10	51 41		15
46	00	10 20	2	21 30	6	34 41	10	51 56		14
	10	10 22	3	21 36	6	34 51	10	52 10		14
	20	10 25	3	21 42	6	35 01	10	52 24		15
	30	10 28	3	21 48	6	35 11	09	52 39		14
	40	10 31	3	21 54	6	35 20	10	52 53		14
	50	10 34	3	22 00	7	35 30	10	53 07		15
47	00	10 37	3	22 07	6	35 40	09	53 22		15
	10	10 40	2	22 13	6	35 49	10	53 37		15
	20	10 43	3	22 19	6	35 59	10	53 52		15
	30	10 45	3	22 25	6	36 09	10	54 07		14
	40	10 48	3	22 31	6	36 19	10	54 21		15
	50	10 51	4	22 37	6	36 29	10	54 36		15
48	00	10 55	3	22 43	6	36 39	10	54 51		15
	10	10 58	3	22 49	7	36 49	10	55 06		15
	20	11 01	3	22 56	6	36 55	10	55 21		15
	30	11 04	3	23 02	6	37 09	10	55 36		15
	40	11 07	3	23 08	7	37 19	10	55 51		15
	50	11 10	3	23 15	6	37 29	11	56 06		16
49	00	11 13	3	23 21	6	37 40	10	56 22		15
	10	11 16	3	23 27	6	37 50	10	56 37		15
	20	11 19	3	23 33	6	38 00	10	56 52		16
	30	11 22	3	23 39	6	38 10	10	57 08		15
	40	11 25	3	23 45	7	38 20	10	57 33		15
	50	11 28	3	23 52	7	38 30	11	57 38		16
50	00	11 31	3	23 59	6	38 41	10	57 45		15

Latit.		Fifth			Sixth			Seventh		
gr.	m.	Long.		dif	Long.		dif	Long.		dif
45	10	75	55	21	122	29	34	255	03	71
	20	76	16	22	123	03	34	256	14	72
	30	76	38	21	123	37	34	257	26	72
	40	76	59	22	124	11	35	258	38	72
	50	77	21	22	124	46	35	259	50	72
46	00	77	43	21	125	21	35	261	02	72
	10	78	04	21	125	56	35	262	14	73
	20	78	25	22	126	31	35	263	27	73
	30	78	47	22	127	06	35	264	40	73
	40	79	09	22	127	41	35	265	53	73
	50	79	31	22	128	16	36	267	06	74
47	00	79	53	22	128	52	35	268	20	74
	10	80	15	22	129	27	35	269	34	74
	20	80	37	22	130	02	36	270	48	75
	30	80	59	22	130	38	36	272	03	74
	40	81	21	22	131	14	36	273	17	75
	50	81	43	22	131	50	36	274	32	75
48	00	82	05	22	132	26	36	275	47	75
	10	82	27	23	133	02	36	277	02	75
	20	82	50	23	133	38	37	278	17	76
	30	83	13	23	134	15	36	279	33	76
	40	83	35	23	134	51	37	280	49	77
	50	83	58	23	135	28	37	282	06	77
49	00	84	21	23	136	05	36	283	23	76
	10	84	44	23	136	41	37	284	39	77
	20	85	07	23	137	18	37	285	56	77
	30	85	30	23	137	55	37	287	13	78
	40	85	53	23	138	32	38	288	31	78
	50	86	16	24	139	10	38	289	49	78
50	00	86	40	23	139	48	37	291	07	78

Latit.		First.			Second			Third			Fourth		
gr.	m.	Long.		dif.	Long.		dif.	Long.		dif.	Long.		dif.
50	10	11	34	3	24	06	7	38	51	11	58	09	16
	20	11	37	3	24	12	7	39	02	11	58	25	16
	30	11	40	4	24	19	7	39	13	10	58	41	15
	40	11	44	3	24	26	6	39	23	10	58	56	16
	50	11	47	3	24	32	6	39	33	11	59	12	16
51	00	11	50	3	24	38	7	39	44	10	59	28	16
	10	11	53	3	24	45	6	39	54	11	59	44	16
	20	11	56	4	24	51	7	40	05	11	60	00	16
	30	12	00	3	24	58	7	40	16	11	60	16	16
	40	12	03	3	25	05	7	40	27	11	60	32	16
	50	12	06	3	25	12	6	40	38	11	60	48	17
52	00	12	09	3	25	18	7	40	49	11	61	05	16
	10	12	12	3	25	25	7	41	00	11	61	21	16
	20	12	15	4	25	32	7	41	11	11	61	37	17
	30	12	19	3	25	39	6	41	22	11	61	54	16
	40	12	22	3	25	45	7	41	33	11	62	10	17
	50	12	25	3	25	52	7	41	44	11	62	27	17
53	00	12	28	4	25	59	7	41	55	11	62	44	16
	10	12	32	4	26	06	7	42	06	11	63	00	17
	20	12	36	3	26	13	7	42	17	11	63	17	17
	30	12	39	3	26	20	7	42	28	11	63	34	16
	40	12	42	3	26	27	7	42	39	11	63	50	17
	50	12	45	4	26	34	7	42	50	12	64	07	17
54	00	12	49	3	26	41	7	43	02	11	64	24	17
	10	12	52	4	26	48	7	43	13	11	64	41	17
	20	12	56	3	26	55	7	43	24	12	64	58	18
	30	12	59	3	27	02	7	43	36	11	65	16	17
	40	13	02	4	27	09	7	43	47	12	65	33	17
	50	13	06	4	27	16	7	43	59	12	65	50	18
55	00	13	10	3	27	23	7	44	11	11	66	08	17

Latit.		Fifth			Sixth			Seventh		
gr.	m.	Long.		dif	Long.		dif	Long.		dif
50	10	87	03	23	140	25	38	292	25	78
	20	87	26	24	141	03	38	293	43	78
	30	87	50	23	141	41	38	295	02	79
	40	88	13	24	142	19	38	296	21	80
	50	88	37	24	142	57	38	297	41	80
51	00	89	01	23	143	35	38	299	01	80
	10	89	24	24	144	13	39	300	21	80
	20	89	48	24	144	52	39	301	41	81
	30	90	12	24	145	31	39	303	02	81
	40	90	36	24	146	10	39	304	23	81
	50	91	00	25	146	49	39	305	44	81
52	00	91	25	24	147	28	39	307	05	82
	10	91	49	24	148	07	39	308	27	82
	20	92	13	25	148	46	40	309	49	83
	30	92	38	24	149	26	40	311	12	82
	40	93	02	25	150	06	40	312	34	83
	50	93	27	25	150	46	40	313	57	83
53	00	93	52	25	151	26	40	315	20	84
	10	94	17	25	152	06	40	316	44	84
	20	94	42	26	152	46	41	318	08	85
	30	95	08	25	153	27	40	319	33	84
	40	95	33	25	154	07	41	320	57	85
	50	95	58	25	154	48	41	322	22	85
54	00	96	23	25	155	29	41	323	47	86
	10	96	48	26	156	10	41	325	13	86
	20	97	14	26	156	51	42	326	39	87
	30	97	40	26	157	33	42	328	06	87
	40	98	06	26	158	15	42	329	33	87
	50	98	32	26	158	57	42	331	00	87
55	00	98	58	26	159	39	42	332	27	88

Latit.		First			Second			Third			Fourth		
gr.	m.	Long.		dif	Long.		dif	Long.		dif	Long.		dif
55	10	13	13	3	27	30	8	44	22	12	66	25	17
	20	13	16	4	27	38	7	44	34	12	66	42	18
	30	13	20	3	27	45	7	44	46	12	67	00	18
	40	13	23	4	27	52	8	44	58	12	67	18	18
	50	13	27	3	28	00	7	45	10	12	67	36	18
56	00	13	30	3	28	07	8	45	22	12	67	54	18
	10	13	33	4	28	15	8	45	34	12	68	12	18
	20	13	37	4	28	23	7	45	46	12	68	30	18
	30	13	41	3	28	30	7	45	58	12	68	48	18
	40	13	44	4	28	37	8	46	10	12	69	06	18
	50	13	48	4	28	45	7	46	22	13	69	24	18
57	00	13	52	4	28	52	8	46	35	12	69	42	18
	10	13	56	4	29	00	8	46	47	12	70	00	19
	20	14	00	3	29	08	7	46	59	13	70	19	19
	30	14	03	4	29	15	8	47	12	12	70	38	18
	40	14	07	4	29	23	8	47	24	12	70	56	19
	50	14	11	3	29	31	7	47	36	13	71	15	19
58	00	14	14	4	29	38	8	47	49	12	71	34	19
	10	14	18	4	29	46	8	48	01	13	71	53	19
	20	14	22	4	29	54	8	48	14	13	72	12	19
	30	14	26	3	30	02	8	48	27	13	72	31	19
	40	14	29	4	30	10	8	48	40	13	72	50	19
	50	14	33	4	30	18	8	48	52	13	73	09	20
59	00	14	37	4	30	26	9	49	06	13	73	29	19
	10	14	41	3	30	35	8	49	19	13	73	48	19
	20	14	44	4	30	43	8	49	32	13	74	07	20
	30	14	48	4	30	51	8	49	45	13	74	27	20
	40	14	52	4	30	59	8	49	58	13	74	47	20
	50	14	56	4	31	07	8	50	11	14	75	07	20
60	00	15	00	4	31	15	9	50	25	13	75	27	20

Latit.		Fifth			Sixth			Seventh		
gr.	m.	Long.		dif	Long.		dif	Long.		dif
55	10	99	24	26	160	21	42	333	55	88
	20	99	50	27	161	03	43	335	23	89
	30	100	17	26	161	46	43	336	52	89
	40	100	43	27	162	29	43	338	21	89
	50	101	10	27	163	12	43	339	50	89
56	00	101	37	27	163	55	43	341	19	98
	10	102	04	27	164	38	43	342	49	91
	20	102	31	27	165	21	44	344	20	91
	30	102	58	27	166	05	44	345	51	91
	40	103	25	27	166	49	44	347	22	92
	50	103	52	27	167	33	45	348	54	92
57	00	104	19	27	168	18	44	350	26	93
	10	104	46	28	169	02	44	351	59	93
	20	105	14	28	169	46	45	353	32	93
	30	105	42	28	170	31	45	355	05	94
	40	106	10	28	171	16	45	356	39	94
	50	106	38	29	172	01	46	358	13	94
58	00	107	07	28	172	47	45	359	47	95
	10	107	35	28	173	32	46	361	22	96
	20	108	03	29	174	18	46	362	58	96
	30	108	32	28	175	04	46	364	34	97
	40	109	00	29	175	50	47	366	11	97
	50	109	29	29	176	37	47	367	48	97
59	00	109	58	29	177	24	47	369	25	98
	10	110	27	29	178	11	47	371	03	98
	20	110	56	30	178	58	48	372	41	99
	30	111	26	29	179	46	48	374	20	99
	40	111	55	30	180	34	48	375	59	100
	50	112	25	30	181	22	48	377	39	100
60	00	112	55	30	182	10	48	379	19	101

Latit.		First		Second		Third		Fourth	
gr.	m.	Long.	dif	Long.	dif	Long.	dif	Long.	dif
60	10	15 04	4	31 24	8	50 38	13	75 47	20
	20	15 08	4	31 32	9	50 51	14	76 07	20
	30	15 12	4	31 41	8	51 05	14	76 27	20
	40	15 16	4	31 49	8	51 19	14	76 47	21
	50	15 20	5	31 57	8	51 33	14	77 08	21
61	00	15 25	4	32 05	9	51 47	13	77 29	20
	10	15 29	4	32 14	9	52 00	14	77 49	21
	20	15 33	4	32 23	9	52 14	14	78 10	21
	30	15 37	4	32 32	9	52 28	14	78 31	21
	40	15 41	5	32 41	8	52 42	14	78 52	21
	50	15 46	4	32 49	9	52 56	15	79 13	21
62	00	15 50	4	32 58	9	53 11	14	79 34	21
	10	15 54	4	33 07	9	53 25	14	79 55	22
	20	15 58	5	33 16	9	53 39	14	80 17	22
	30	16 03	4	33 25	9	53 53	15	80 39	22
	40	16 07	5	33 34	9	54 08	15	81 01	22
	50	16 12	4	33 43	9	54 23	15	81 23	22
63	00	16 16	4	33 52	9	54 38	14	81 45	22
	10	16 20	5	34 01	9	54 52	15	82 07	22
	20	16 25	4	34 10	9	55 07	15	82 29	22
	30	16 29	5	34 19	9	55 22	15	82 51	22
	40	16 34	4	34 28	10	55 32	15	83 13	23
	50	16 38	5	34 38	9	55 52	15	83 36	23
64	00	16 43	4	34 47	10	56 07	15	83 59	23
	10	16 47	5	34 57	10	56 22	15	84 22	23
	20	16 52	4	35 07	9	56 37	16	84 45	23
	30	16 56	5	35 16	10	56 53	16	85 08	23
	40	17 01	4	35 26	10	57 09	16	85 31	23
	50	17 05	5	35 36	9	57 25	16	85 54	24
65	00	17 10	5	35 45	10	57 41	15	86 18	24

Latit.		Fifth			Sixth.			Seventh.		
gr.	m.	Long.		dif	Long.		dif	Long.		dif
60	10	113	25	30	182	58	48	381	00	101
	20	113	55	31	183	46	49	382	41	102
	30	114	26	30	184	35	49	384	23	102
	40	114	56	31	185	24	50	386	05	103
	50	115	27	31	186	14	50	387	48	103
61	00	115	58	31	187	04	50	389	31	104
	10	116	29	31	187	54	50	391	15	105
	20	117	00	31	188	44	50	393	00	105
	30	117	31	31	189	34	51	394	45	106
	40	118	02	31	190	25	51	396	31	106
	50	118	33	32	191	16	51	398	17	107
62	00	119	05	32	192	07	51	400	04	108
	10	119	37	32	192	58	52	401	52	108
	20	120	09	33	193	50	52	403	40	108
	30	120	42	32	194	42	52	405	27	109
	40	121	14	33	195	34	53	407	17	109
	50	121	47	33	196	27	53	409	06	110
63	00	122	20	33	197	20	53	410	56	112
	10	122	53	33	198	13	54	712	48	112
	20	123	26	34	199	07	54	414	40	112
	30	124	00	33	200	01	54	416	32	113
	40	124	33	34	200	55	55	418	25	114
	50	125	07	34	201	50	55	420	19	114
64	00	125	41	34	202	45	55	422	13	115
	10	226	15	25	503	40	56	414	08	116
	20	126	50	35	204	36	56	426	04	116
	30	127	25	35	205	32	56	428	00	117
	40	128	00	35	206	28	57	429	57	118
	50	128	35	35	207	25	57	431	55	118
65	00	129	10	35	208	22	57	435	53	120

Latit.		First.			Second			Third			Fourth		
gr.	m.	Long.		dif	Long.		dif	Long.		dif	Long.		dif
65	10	17	15	4	35	55	10	57	56	16	86	42	24
	20	17	19	5	36	05	10	58	12	16	87	06	24
	30	17	24	5	36	15	10	58	28	16	87	30	24
	40	17	29	5	36	25	10	58	44	16	87	54	24
	50	17	34	5	36	35	10	59	00	17	88	18	25
66	00	17	39	4	36	45	10	59	17	16	88	43	24
	10	17	43	5	36	55	11	59	33	16	89	07	25
	20	17	48	5	37	06	10	59	49	17	89	32	25
	30	17	53	5	37	16	10	60	06	17	89	57	25
	40	17	58	5	37	26	11	60	23	17	90	22	25
	50	18	03	5	37	37	11	60	40	18	90	47	26
67	00	18	08	5	37	48	10	60	58	17	91	13	26
	10	18	13	6	37	58	11	61	15	17	91	39	26
	20	18	19	5	36	09	11	61	32	17	92	05	26
	30	18	24	6	38	20	11	61	49	18	92	31	26
	40	18	30	5	38	31	11	62	07	18	92	57	26
	50	18	35	5	38	42	11	62	25	18	93	23	27
68	00	18	40	5	38	53	11	62	43	17	93	50	27
	10	18	45	6	39	04	11	63	09	18	94	17	27
	20	18	51	6	39	15	11	63	18	18	94	44	27
	30	18	57	5	39	26	12	63	36	18	95	11	27
	40	19	02	5	39	38	11	63	54	19	95	38	28
	50	19	07	6	39	49	11	64	13	19	96	06	28
69	00	19	13	5	40	00	12	64	32	18	96	34	28
	10	19	18	6	40	12	12	64	50	19	97	02	28
	20	19	24	5	40	24	13	65	09	19	97	30	28
	30	19	29	6	40	35	12	65	28	19	97	58	29
	40	19	35	6	40	47	13	65	47	19	98	27	29
	50	19	41	6	40	58	12	66	06	20	98	56	29
70	00	19	47	6	41	10	12	66	26	20	99	25	29

Latit.		Fifth			Sixth			Seventh		
gr.	m.	Long.		dif	Long.		dif	Long.		dif
65	10	129	45	36	209	19	58	435	53	120
	20	130	21	36	210	17	58	437	53	121
	30	130	57	36	211	15	58	439	54	122
	40	131	33	36	212	13	59	441	56	122
	50	132	09	37	213	12	59	443	58	123
66	00	132	46	37	214	11	60	446	01	124
	10	133	23	37	215	11	60	448	05	125
	20	134	00	38	216	11	60	450	10	125
	30	134	38	38	217	11	61	452	15	126
	40	135	16	38	218	12	61	454	21	127
	50	135	54	38	219	13	61	456	28	129
67	00	136	32	38	220	14	62	458	37	129
	10	137	10	39	221	16	62	460	46	130
	20	137	49	39	222	18	63	462	56	131
	30	138	28	39	223	21	63	465	07	132
	40	139	07	39	224	24	64	467	19	133
	50	139	46	40	225	28	64	469	32	134
68	00	140	26	40	226	32	65	471	46	135
	10	141	06	41	227	37	65	474	01	136
	20	141	47	41	228	42	66	476	17	136
	30	142	28	41	229	48	66	478	33	138
	40	143	09	41	230	54	67	480	51	138
	50	143	50	41	232	01	67	483	09	139
69	00	144	31	42	233	08	68	485	28	141
	10	145	13	42	234	16	68	487	49	142
	20	145	55	43	235	24	68	490	11	143
	30	146	38	43	236	32	69	492	34	144
	40	147	21	43	237	41	70	494	58	145
	50	148	04	43	238	51	70	497	23	146
70	00	148	47	44	240	01	71	499	49	148

Lame.		First.			Second			Third.			Fourth		
gr.	m.	Long.		dif.	Long.		dif.	Long.		dif.	Long.		dif.
70	10	19	53	6	41	23	12	66	46	19	99	54	30
	20	19	59	5	41	35	13	67	05	19	100	24	30
	30	20	04	6	41	48	12	67	25	20	100	54	30
	40	20	10	6	42	00	13	67	45	20	101	24	30
	50	20	16	6	42	13	12	68	05	21	101	54	31
71	00	20	22	6	42	25	13	68	26	20	102	25	31
	10	20	28	6	42	38	13	68	46	21	102	56	31
	20	20	34	7	42	51	13	69	07	21	103	27	31
	30	20	41	6	43	04	13	69	28	21	103	58	32
	40	20	47	6	43	17	13	69	49	21	104	30	32
	50	20	53	7	43	30	14	70	10	22	105	02	32
72	00	21	00	6	43	44	13	70	32	22	105	34	32
	10	21	06	6	43	57	13	70	54	22	106	06	33
	20	21	12	7	44	10	14	71	16	22	106	39	33
	30	21	19	7	44	24	14	71	38	22	107	12	34
	40	21	26	7	44	38	14	72	00	23	107	46	34
	50	21	33	7	44	52	14	72	23	23	108	20	34
73	00	21	40	6	45	06	14	72	46	23	108	54	34
	10	21	46	7	45	20	14	73	09	23	109	28	35
	20	21	52	7	45	34	15	73	32	23	110	03	35
	30	22	06	7	45	49	15	73	55	24	110	38	35
	40	22	07	7	46	04	15	74	19	24	111	13	36
	50	22	14	7	46	19	15	74	43	24	111	49	36
74	00	22	21	8	46	34	15	75	07	25	112	25	36
	10	22	29	7	46	49	15	75	32	24	113	01	37
	20	22	36	8	47	04	16	75	56	25	113	38	38
	30	22	44	7	47	20	15	76	21	25	114	15	38
	40	22	51	8	47	35	16	76	46	25	114	53	38
	50	22	59	7	47	51	16	77	11	26	115	31	38
75	00	23	06	8	48	07	16	77	37	26	116	09	38

Latit.		Fifth.			Sixth.			Seventh.		
gr.	m.	Long		dif	Long.		dif	Long.		dif
70	10	149	31	44	241	12	72	502	17	149
	20	150	15	45	242	24	72	504	46	150
	30	151	00	45	243	36	73	507	16	151
	40	151	45	46	244	49	73	509	47	152
	50	152	31	46	246	02	74	512	19	154
71	00	153	17	46	247	16	74	514	53	155
	10	154	03	46	248	30	75	517	28	156
	20	154	49	47	249	45	76	520	04	158
	30	155	36	48	251	01	76	522	42	159
	40	156	24	48	252	17	77	525	21	161
	50	157	12	48	253	34	78	528	02	162
72	00	158	00	49	254	52	78	530	44	163
	10	158	49	49	256	10	79	533	27	165
	20	159	38	49	257	29	80	536	12	166
	30	160	27	50	258	49	81	538	58	168
	40	161	17	50	260	10	82	541	46	170
	50	162	07	51	261	32	82	544	36	171
73	00	162	58	51	262	54	83	547	27	173
	10	163	49	52	264	17	84	550	20	174
	23	164	41	53	225	41	84	553	14	176
	30	165	34	53	267	05	85	556	10	178
	40	166	27	54	268	30	86	559	08	180
	50	167	21	54	269	56	87	562	08	181
74	00	168	15	55	271	23	88	565	09	183
	10	169	10	55	272	51	89	568	12	185
	20	169	55	55	274	20	90	571	17	187
	30	171	00	56	275	50	91	574	24	189
	40	171	56	57	277	21	92	577	33	191
	50	172	53	57	278	53	93	580	44	194
75	00	173	50	58	280	26	94	583	58	196

Suns Declination 1677, 1681, 1685, 1689.

Days.	Janua. South		Februa. South		March. South		April. North		May. North		June. North	
01	21	42	13	44	03	23	08	37	18	06	23	11
02	21	32	13	24	02	59	08	59	18	21	23	15
03	21	22	13	04	02	35	09	21	18	35	23	18
04	21	11	12	44	02	12	09	42	18	50	23	21
05	21	00	12	23	01	48	10	03	19	04	23	23
06	20	48	12	02	01	24	10	25	19	18	23	26
07	20	36	11	41	01	01	10	46	19	31	23	27
08	20	24	11	19	00	37	11	07	19	44	23	29
09	20	11	10	58	00	13	11	27	19	57	23	29
10	19	57	10	36	Nor.	11	11	48	20	10	23	30
11	19	44	10	15	00	34	12	08	20	22	23	30
12	19	30	09	53	00	58	12	28	20	33	23	30
13	19	16	09	31	01	21	12	48	20	45	23	29
14	19	01	09	08	01	45	13	08	20	56	23	28
15	18	46	08	46	02	09	13	27	21	07	23	26
16	18	31	08	24	02	32	13	46	21	17	23	24
17	18	15	08	01	02	55	14	06	21	27	23	22
18	17	59	07	36	03	19	14	24	21	37	23	19
19	17	43	07	15	03	42	14	43	21	46	23	16
20	17	26	06	52	04	05	15	01	21	55	23	12
21	17	09	06	29	04	29	15	19	22	03	23	08
22	16	52	06	06	04	52	15	37	22	11	23	03
23	16	34	05	43	05	15	15	55	22	19	22	58
24	16	16	05	20	05	38	16	12	22	26	22	53
25	15	58	04	57	06	00	16	29	22	33	22	48
26	15	40	04	33	06	23	16	46	22	40	22	41
27	15	21	04	10	06	46	17	02	22	46	22	35
28	15	02	03	46	07	08	17	19	22	52	22	28
29	14	43			07	31	17	35	22	57	22	21
30	14	24			07	53	17	50	23	02	22	13
31	14	00			08	15			23	07		

Suns Declination, 1677, 1681, 1685, 1689.

Days.	July. North		August. North		Septem. North		October South		Novem. South		Decem. South	
01	22	05	15	09	04	20	07	18	17	42	23	08
02	21	57	14	50	03	57	07	41	17	58	23	12
03	21	48	14	32	03	34	08	03	18	14	23	16
04	21	39	14	13	03	11	08	26	18	29	23	19
05	21	30	13	55	02	48	08	48	18	44	23	22
06	21	20	13	36	02	24	09	10	18	53	23	25
07	21	10	13	16	02	01	09	32	19	14	23	27
08	20	59	12	57	01	38	09	54	19	28	23	28
09	20	48	12	37	01	14	10	16	19	42	23	29
10	20	37	12	17	00	51	10	38	19	56	23	30
11	20	25	11	57	00	27	10	59	20	09	23	30
12	20	13	11	37	00	04	11	21	20	22	23	40
13	20	01	11	17	Sou.	20	11	42	20	34	23	29
14	19	48	10	56	00	43	12	03	20	46	23	28
15	19	35	10	35	01	07	12	23	20	58	23	26
16	19	22	10	14	01	30	12	44	21	09	23	23
17	19	08	09	53	01	54	13	04	21	20	23	21
18	18	54	09	32	02	17	13	24	21	31	23	17
19	18	40	09	10	02	41	13	44	21	41	23	14
20	18	25	08	49	03	04	14	04	21	50	23	10
21	18	11	08	27	03	27	14	24	22	00	23	05
22	17	56	08	05	03	51	14	43	22	08	23	00
23	17	40	07	43	04	14	15	02	22	17	22	54
24	17	24	07	21	04	37	15	21	22	25	22	48
25	17	08	06	59	05	01	15	39	22	32	22	42
26	16	52	06	36	05	24	15	58	22	39	22	35
27	16	35	06	14	05	47	16	16	22	46	22	28
28	16	19	05	51	06	10	16	33	22	52	22	20
29	16	01	05	29	06	33	16	51	22	58	22	12
30	15	44	05	06	06	56	17	08	23	03	22	03
31	15	27	04	43			17	25			21	54

Suns Declination 1678, 1682, 1686, 1690.

Day	Janua.		Februa.		March.		April.		May.		June.	
	South		South		South		North		North		North	
01	21	45	13	49	03	28	08	32	18	02	23	10
02	21	35	13	29	03	05	08	54	18	17	23	14
03	21	24	13	09	02	45	09	15	18	32	23	17
04	21	14	12	49	02	17	09	37	18	46	23	20
05	21	02	12	28	01	54	09	58	19	00	23	23
06	20	51	12	07	01	30	10	20	19	14	23	25
07	20	39	11	46	01	06	10	41	19	28	23	27
08	20	27	11	25	00	43	11	02	19	41	23	28
09	20	14	11	03	00	19	11	22	19	54	23	29
10	20	01	10	42	Nov.	05	11	43	20	07	23	30
11	19	47	10	20	00	28	12	04	20	19	23	30
12	19	33	09	58	00	52	12	23	20	31	23	30
13	19	19	09	36	01	16	12	43	20	42	23	29
14	19	05	09	14	01	39	13	03	20	53	23	28
15	18	50	08	52	02	03	13	23	21	04	23	26
16	18	34	08	29	02	26	13	42	21	15	23	25
17	18	19	08	06	02	50	14	01	21	25	23	21
18	18	03	07	44	03	13	14	20	21	34	23	19
19	17	47	07	21	03	37	14	38	21	44	23	16
20	17	30	06	58	04	00	14	57	21	53	23	13
21	17	13	06	35	04	23	15	15	21	01	23	09
22	16	56	06	12	04	46	15	33	22	09	23	04
23	16	39	05	49	05	09	15	51	22	17	23	00
24	16	21	05	26	05	32	16	08	22	25	22	54
25	16	03	05	02	05	55	16	25	22	32	22	49
26	15	44	04	39	06	18	16	42	22	38	22	43
27	15	26	04	15	06	40	16	58	22	45	22	37
28	15	07	03	52	07	03	17	15	22	51	22	30
29	14	48			07	25	17	31	22	56	22	23
30	14	29			07	48	17	46	23	01	22	15
31	14	09			08	10			23	06		

Suns Declination, 1678, 1682, 1686, 1690.

Days	July North		August North		Septem. North		October South		Novem. South		Decem. South	
01	22	07	15	13	04	26	07	43	17	37	23	07
02	21	59	14	55	04	03	07	35	17	54	23	11
03	21	50	14	37	03	40	07	58	18	10	23	15
04	21	41	14	18	03	16	08	21	18	25	23	19
05	21	32	13	59	02	53	08	43	18	41	23	22
06	21	22	13	40	02	30	09	05	18	56	23	24
07	21	12	13	21	02	07	09	27	19	11	23	26
08	21	02	13	02	01	43	09	49	19	25	23	28
09	20	51	12	42	01	20	10	11	19	39	23	29
10	20	40	12	22	00	57	10	33	19	53	23	30
11	20	28	12	02	00	33	10	54	20	06	23	30
12	20	16	11	42	00	10	11	15	20	14	23	30
13	20	04	11	21	Son.	14	11	37	20	31	23	29
14	19	51	11	01	00	37	11	58	20	43	23	28
15	19	38	10	40	01	01	12	18	20	55	23	26
16	19	25	10	19	01	24	12	39	21	07	23	24
17	19	12	09	58	01	48	12	59	21	18	23	21
18	18	58	09	37	02	11	13	20	21	28	23	18
19	18	44	09	16	02	35	13	40	21	38	23	15
20	18	29	08	54	02	58	13	59	21	48	23	11
21	18	14	08	32	03	22	14	19	21	57	23	06
22	17	59	08	10	03	45	14	38	22	06	23	01
23	17	44	07	48	04	08	14	57	22	15	22	56
24	17	28	07	26	04	32	15	16	22	23	22	50
25	17	12	07	04	04	55	15	35	22	30	22	44
26	16	55	06	42	05	18	15	53	22	38	22	37
27	16	39	06	19	05	41	16	11	22	44	22	30
28	16	23	05	57	06	04	16	29	22	51	22	22
29	16	06	05	34	06	27	16	47	22	56	22	14
30	15	48	05	11	06	50	17	04	23	02	22	05
31	15	31	04	49			17	21			21	56

Suns Declination 1679, 1683, 1687, 1691.

Days.	Janua. South		Februa. South		March South		April North		May North		June North	
01	21	47	13	54	03	34	08	26	17	58	23	09
02	21	37	13	34	03	10	08	48	18	13	23	13
03	21	27	13	14	02	47	09	10	18	28	23	16
04	21	16	12	54	02	23	09	32	18	43	23	20
05	21	05	12	33	01	59	09	53	18	57	23	22
06	20	54	12	11	01	36	10	14	19	11	23	25
07	20	42	11	51	01	12	10	36	19	25	23	27
08	20	30	11	30	00	48	10	56	19	38	23	28
09	20	17	11	09	00	25	11	17	19	51	23	29
10	20	04	10	47	00	01	11	38	20	04	23	30
11	19	51	10	25	Nor.	23	11	58	20	16	23	30
12	19	37	10	05	00	46	12	18	20	28	23	30
13	19	23	09	41	01	10	12	38	20	39	23	29
14	19	08	09	19	01	34	12	58	20	51	23	28
15	18	53	08	57	01	57	13	18	21	02	23	27
16	18	38	08	35	02	21	13	37	21	12	23	21
17	18	23	08	12	02	44	13	56	21	22	23	23
18	18	07	07	49	03	08	14	15	21	32	23	20
19	17	51	07	27	03	31	14	34	21	41	23	17
20	17	34	07	04	03	54	14	52	21	50	23	14
21	17	17	06	41	04	17	15	11	21	59	23	10
22	17	00	06	18	04	41	15	29	22	07	23	06
23	16	43	05	54	05	04	15	46	22	15	23	01
24	16	25	05	31	05	27	16	04	22	23	22	56
25	16	07	05	08	05	49	16	21	22	30	22	50
26	15	49	04	44	06	12	16	33	22	37	22	44
27	15	30	04	21	06	35	16	54	22	43	22	38
28	15	12	03	58	06	57	17	11	22	49	22	32
29	14	53			07	20	17	27	22	55	22	25
30	14	33			07	42	17	43	23	00	22	17
31	14	14			08	04			23	05		

Suns Declination 1679, 1683, 1687, 1691.

Days.	*July* North		*August* North		*Septemb.* North		*October* South		*Novemb.* South		*Decemb.* South	
01	22	09	15	17	04	31	07	07	17	33	23	05
02	22	01	14	59	04	08	07	30	17	50	23	10
03	21	53	14	41	03	45	07	53	18	06	23	14
04	21	44	14	23	03	22	08	15	18	22	23	18
05	21	34	14	04	02	59	08	37	18	37	23	21
06	21	25	13	45	02	36	09	00	18	52	23	24
07	21	15	13	26	02	12	09	22	19	07	23	26
08	21	04	13	06	01	49	09	44	19	21	23	28
09	20	53	12	44	01	26	10	06	19	36	23	29
10	20	42	12	27	01	02	10	27	19	49	23	30
11	20	31	12	07	00	39	10	49	20	03	23	30
12	20	19	11	47	00	15	11	10	20	16	23	30
13	20	07	11	27	*Sou.*	08	11	31	20	28	23	29
14	19	54	11	06	00	32	11	52	20	40	23	28
15	19	42	10	45	00	55	12	13	20	52	23	27
16	19	28	10	24	01	19	12	34	21	04	23	25
17	19	15	10	03	01	42	12	54	21	15	23	22
18	19	01	09	42	02	06	13	15	21	26	23	19
19	18	47	09	21	02	29	13	35	21	36	23	16
20	18	33	08	59	02	53	13	55	21	46	23	12
21	18	18	08	38	03	16	14	14	21	55	23	07
22	18	03	08	16	03	39	14	33	22	04	23	02
23	17	48	07	54	04	03	14	53	22	13	22	57
24	17	32	07	32	04	26	15	12	22	21	22	51
25	17	16	07	10	04	49	15	30	22	29	22	45
26	17	00	06	47	05	13	15	49	22	36	22	39
27	16	43	06	25	05	36	16	07	22	43	22	31
28	16	27	06	02	05	59	16	24	22	49	22	34
29	16	10	05	40	06	22	16	42	22	55	22	16
30	15	53	05	17	06	45	17	00	23	00	22	07
31	15	35	04	54			17	17			21	59

Suns Declination 1676, 1680, 1684, 1688.

Days.	January South		February South		March South		April North		May North		June North	
01	21	49	13	59	03	16	08	43	18	10	23	12
02	21	39	13	39	02	52	09	05	18	25	23	16
03	21	29	13	19	02	29	09	26	18	39	23	19
04	21	19	12	59	02	05	09	48	18	54	23	22
05	21	08	12	38	01	42	10	09	19	08	23	24
06	20	56	12	17	01	18	10	30	19	21	23	26
07	20	45	11	56	00	54	10	51	19	35	23	28
08	20	33	11	35	00	30	11	12	19	48	23	29
09	20	20	11	14	00	07	11	33	20	01	23	30
10	20	07	10	52	Nor.	17	11	53	20	13	23	30
11	19	54	10	31	00	41	12	14	20	25	23	30
12	19	40	10	09	01	04	12	34	20	37	23	29
13	19	26	09	47	01	28	12	53	20	48	23	28
14	19	12	09	25	01	51	13	13	20	59	23	27
15	18	57	09	02	02	15	13	33	21	10	23	25
16	18	42	08	40	02	38	13	52	21	20	23	23
17	18	26	08	17	03	02	14	11	21	30	23	21
18	18	11	07	55	03	25	14	29	21	39	23	18
19	17	55	07	32	03	48	14	48	21	48	23	15
20	17	38	07	09	04	12	15	06	21	57	23	11
21	17	21	06	46	04	35	15	24	22	06	23	07
22	17	04	06	23	04	58	15	42	22	13	23	02
23	16	47	06	00	05	21	15	59	22	21	22	57
24	16	30	05	37	05	44	16	17	22	28	22	52
25	16	12	05	14	06	07	16	24	22	35	22	46
26	15	53	04	50	06	29	16	50	22	42	22	40
27	15	35	04	27	06	52	17	07	22	48	22	33
28	15	16	04	03	07	14	27	23	22	53	22	26
29	14	57	03	40	07	37	17	39	22	58	22	19
30	14	38			07	59	17	54	23	03	22	11
31	14	19			08	21			23	08		

Sun's Declination 1676, 1680, 1684, 1688.

Days.	*July* North		*August* North		*Septemb.* North		*October* South		*Novemb.* South		*December* South	
01	22	03	15	04	04	14	07	25	17	46	23	09
02	21	55	14	45	03	51	07	47	18	02	23	13
03	21	46	14	27	03	28	08	10	18	18	23	17
04	21	37	14	08	03	04	08	32	18	33	23	20
05	21	27	13	49	12	41	08	54	18	49	23	23
06	21	17	13	30	02	18	09	16	19	03	23	25
07	21	07	13	11	01	55	09	38	19	18	23	27
08	20	56	12	52	01	31	10	00	19	32	23	29
09	20	45	12	32	01	08	10	22	19	46	23	29
10	20	34	12	12	00	44	10	44	19	59	23	30
11	20	22	11	52	00	21	11	05	20	13	23	30
12	20	10	11	31	*Sou.*	30	11	26	20	25	23	29
13	19	57	11	11	00	26	11	47	20	38	23	28
14	89	45	10	50	00	50	12	08	20	50	23	27
15	19	32	10	29	01	13	12	29	21	01	23	25
16	19	18	10	08	01	37	12	49	21	12	23	23
17	19	04	09	47	02	00	13	10	21	23	23	20
18	28	50	09	26	02	24	13	30	21	33	23	16
19	18	36	09	04	02	47	13	50	21	43	23	13
20	18	21	08	43	03	10	14	09	21	53	23	08
21	18	07	08	21	03	34	14	29	22	02	23	04
22	17	51	07	59	03	57	14	48	22	11	22	58
23	17	36	07	37	04	20	15	07	22	19	22	53
24	17	20	07	15	04	44	15	26	22	27	22	47
25	17	04	06	53	05	07	15	44	22	34	22	40
26	16	47	06	30	05	30	16	02	22	41	22	33
27	16	31	06	08	05	53	16	20	22	48	22	26
28	16	14	05	45	06	16	16	38	22	54	22	18
29	15	57	05	23	06	39	16	55	22	59	22	09
30	15	39	05	00	07	02	17	12	23	04	22	01
31	15	22	04	37			17	29			21	52

A Table of the Sun's right Aſcenſion.

Days	January Aſcenſ. H.	M.	February Aſcenſ. H.	M.	March Aſcenſ. H.	M.	April Aſcenſ. H.	M.	May Aſcenſ. H.	M.	June Aſcenſ. H.	M.
01	19	35	21	42	23	28	1	21	3	14	5	19
02	19	39	21	46	23	32	1	25	3	18	5	23
03	19	43	21	50	23	36	1	29	3	22	5	27
04	19	47	21	54	23	39	1	33	3	26	5	31
05	19	51	21	58	23	43	1	36	3	30	5	36
06	19	56	22	02	23	46	1	40	3	34	5	40
07	20	00	22	06	23	50	1	44	3	38	5	44
08	20	04	22	10	23	53	1	47	3	42	5	48
09	20	09	22	14	23	57	1	51	3	46	5	52
10	20	13	22	17	0	01	1	54	3	50	5	56
11	20	17	22	21	0	05	1	58	3	54	6	00
12	20	22	22	25	0	08	2	02	3	58	6	04
13	20	26	22	29	0	12	2	06	4	02	6	08
14	20	30	22	33	0	15	2	10	4	06	6	12
15	20	34	22	36	0	19	2	13	4	10	6	17
16	20	38	22	40	0	23	2	17	4	14	6	21
17	20	42	22	44	0	26	2	21	4	18	6	25
18	20	46	22	48	0	30	2	25	4	22	6	29
19	20	50	22	52	0	33	2	29	4	26	6	33
20	20	54	22	55	0	37	2	32	4	30	6	38
21	20	51	22	59	0	41	2	36	4	34	6	42
22	21	03	23	03	0	44	2	40	4	38	6	46
23	21	07	23	06	0	48	2	44	4	42	6	50
24	21	11	23	10	0	52	2	48	4	46	6	54
25	21	15	23	13	0	55	2	51	4	50	6	58
26	21	19	23	17	0	59	2	55	4	54	7	02
27	21	23	23	21	1	03	2	59	4	58	7	06
28	21	27	23	25	1	06	3	03	5	02	7	10
29	21	31			1	10	3	07	5	06	7	14
30	21	35			1	14	3	10	5	11	7	19
31	21	38			1	17			5	15		

A Table of the Sun's right Aſcenſion.

Days.	July		August		Septemb.		October		Novemb.		Decemb.	
	Aſcenſ.		Aſcenſ.		Aſcenſ.		Aſcenſ.		Aſcenſ.		Aſcenſ.	
	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.
01	7	23	9	25	11	19	13	08	15	07	17	15
02	7	27	9	29	11	23	13	12	15	11	17	20
03	7	31	9	33	11	26	13	15	15	15	17	25
04	7	35	9	37	11	30	13	19	15	19	17	29
05	7	39	9	40	11	33	13	22	15	23	17	34
06	7	43	9	44	11	37	13	26	15	27	17	38
07	7	47	9	48	11	41	13	30	15	31	17	42
08	7	51	9	51	11	44	13	34	15	36	17	47
09	7	55	9	55	11	48	13	38	15	40	17	51
10	7	59	9	58	11	51	13	41	15	45	17	56
11	8	03	10	02	11	55	13	45	15	49	18	00
12	8	07	10	06	11	59	13	49	15	53	18	05
13	8	11	10	10	12	02	13	53	15	58	18	09
14	8	15	10	14	12	06	13	57	16	02	18	14
15	8	19	10	17	12	09	14	00	16	07	18	19
16	8	23	10	21	12	13	14	04	16	11	18	24
17	8	27	10	25	12	17	14	08	16	15	18	28
18	8	31	10	28	12	20	14	12	16	19	18	33
19	8	35	10	32	12	24	14	16	16	23	18	37
20	8	39	10	35	12	27	14	20	16	28	18	41
21	8	43	10	39	12	31	14	24	16	32	18	45
22	8	47	10	43	12	35	14	28	16	36	18	49
23	8	51	10	46	12	38	14	32	16	40	18	54
24	8	55	10	50	12	42	14	36	16	44	18	58
25	8	58	10	53	12	45	14	39	16	49	19	03
26	9	02	10	57	12	49	14	43	16	53	19	07
27	9	06	11	01	12	53	14	47	16	57	19	11
28	9	10	11	04	12	57	14	51	17	02	19	16
29	9	14	11	08	13	01	14	55	17	06	19	20
30	9	17	11	11	13	04	14	59	17	11	19	25
31	9	21	11	15			15	03			19	30

The Declination and Right Ascension of the Stars Calculated for Twenty years yet to come.

NAMES.	Right Ascen. H.	M.	Declination. D.	M.		distance from Pole D.	M.
Bulls Eye	04	10	15	48	N	74	12
Arcturus	14	01	20	58	N	69	02
Lyra	18	25	38	30	N	51	30
Medusa's Head *Algol*	02	47	39	39	N	50	21
The Goat *Capella*	04	52	45	37	N	44	23
Lions heart *Regulus*	09	39	13	33	N	76	27
Lions Tail	11	32	16	25	N	73	35
Virgins Spike	13	04	09	31	S	80	29
Scorpions heart	16	09	25	37	S	64	23
Fomahaut	22	39	37	17	S	52	43
Left foot of *Orion*	04	59	08	37	S	81	23
1 in *Orion*'s Girdle	05	03	00	35	S	89	25
2 in *Orion*'s Girdle	05	19	01	26	S	88	34
3 in *Orion*'s Girdle	05	24	02	09	S	87	51
Great Dog *Sirius*	06	31	16	14	S	73	46
Little Dog *Procyon*	07	22	06	03	N	83	57
Hydra's Heart	09	11	07	15	S	82	45
Breast of *Cassiopea*	00	22	54	45	N	35	06
Girdle of *Andromeda*	00	51	33	55	N	56	25
Whale's Belly	01	35	11	54	S	78	06
Hydra's Head	08	21	04	30	N	85	30
Pegasus Mouth	21	28	08	24	N	81	36
Pegasus Shoulder	23	59	13	22	N	76	38
Head of *Andromeda*	23	39	27	18	N	62	42
Perseus Right Side	00	57	48	36	N	41	24
In the Whale's Chap	02	45	02	48	N	87	12
Whale's Tail	00	27	19	48	S	70	12
Orion's Left Shoulder	05	04	06	01	N	83	59
The fore foot of great dog	06	08	17	49	S	72	15
Pole Star	00	31	87	33	N	02	27
The uppermost in the square of the little Bear	14	39	75	36	N	14	24
Left in great Bears Tail	12	39	75	47	N	14	13
Bright Star of the Crown	15	20	27	51	N	62	09

Hercules left Knee	17	44	37	21	N	52	39
Swans Tail	20	28	44	05	N	45	55
Serpentinus Head	17	20	12	52	N	77	08
Bright foot of the Twins	06	18	16	38	N	73	22
Lions neck	10	01	21	29	N	68	31
South ballance	14	32	14	37	S	75	23
North ballance	15	00	08	07	S	81	53

The Use of the preceding Tables.

Of the Table of Meridional Parts.

This Table contains three Columns; in the first are the Degrees of Latitude; in the second are the minutes appertaining to those Degrees; in the third are the Meridional Parts answering to those Degrees and Minutes, shewing the Meridian Diff. Latitude to every 10 *min.* from the Equinoctial to 80 *d.* according to Mr. *Wright*'s Projection.

Example. Suppose the Latitude be 39 *d.* 20 *m.* the Meridional Parts answering thereto are 2571.

Note, to find the Meridional Parts between any two Latitudes; seek in the Table the Meridional Parts for those two Latitudes, and if the Latitudes be both North or both South, the difference; but if the one be North and the other South, the sum of the Meridional Parts, is the difference of Latitude in Meridional Parts.

Of the Tables of Latitude and Departure.

This Table contains 7 Columns, in the 1 and 7

are the Points and quarter Points of the Compaſs, as (in the 1) $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 Point, &c. (in the 7) 8 Points, $7\frac{1}{4}$, $7\frac{1}{2}$, $7\frac{3}{4}$. In the ſecond Column under (D) ſtands. 1, 2, 3, &c. to 10, which is the Diſtance Sailed. In the 3, 4, 5, and 6 Columns, which are diſtinguiſhed with (Dep.) and (Lat.) is the Diff. Latitude and departure.

The uſe of this Table, is to find the Diff. Latitude and Departure, the Courſe and diſtance being given.

Example 1. Suppoſe a Ship Sail *NNE* 9 Leag. to find the Diff. Latitude. and Departure.

The Courſe is 2 Points, and in the Table under 2 Points, and right againſt 9 Leagues, the Diſtance ſtands |3|444| under (Dep.) and |8|314| under (Lat.) which ſhews the Departure to be 3 Leagues $\frac{444}{1000}$, or 3 Leag. $\frac{4}{10}$, and the Diff. Latitude, 8 Leag. $\frac{344}{1000}$, or 8 Leag. $\frac{3}{10}$.

Example 2. Suppoſe a Ship Sail *WNW* $\frac{1}{4}$ *W* 8 Leagues, to find the Diff. Latitude, and Departure.

The Courſe is 6 Points $\frac{1}{4}$, then over the 6 Points $\frac{1}{4}$, and againſt 8 Leag. the Diſtance ſtands |2|695| over (Lat.) and |7|532| over Dep. which ſhews the Diff. Latitude to be 2 Leag. $\frac{6}{10}$, and the Departure 7 Leag. $\frac{5}{10}$. If the Diſtance Sailed exceed 10 Leagues, then call (1) in the Table under (D) 10; 2, 20; 3, 30; &c. and ſo increaſe the value of the Figures in the adjacent Columns, under (Dep.) and (Lat.) accordingly.

Example. A Ship Sails *SE* by *S* $\frac{3}{4}$ *E*, 67 Leag. to find the diff. Latitude and Departure.

Under

Under 3 Points $\frac{3}{4}$, and againſt 6 (which now ſtands for 60) ſtands |4|029| under (Dep.) and |4|445| under (Lat.) that is the Departure is 40 Leag. $\frac{2}{10}$, and the Diff. Lat. 44. Leag. $\frac{4}{10}$: Then for 7 Leagues diſtance, the Dep. is 4 Leag. $\frac{7}{10}$, and the Diff. Lat. 5 Leag. $\frac{1}{10}$, ſo 40 Leag. $\frac{3}{10}$, and 4 Leag. $\frac{7}{10}$ being added together, make the Departure required to be 44 Leag. $\frac{2}{10}$, and the Diff. Latitude required to be 49 Leag. $\frac{5}{10}$.

Of the ſecond Table of Rhombs.

This Table by the Courſe and both Latitudes finds the Diff. of Longitude.

The firſt Column on each Page contains the Degrees and Minutes of Latitude, the other Columns ſhew the Latitudes by which the *Rhomb* paſſes, diſtinguiſhed by, (firſt) (ſecond) (third) (fourth) (fifth) ſixth and (ſeventh) *Rhomb* or Points of the Compaſs.

Example. A Ship Sails *S S W* from the Lat. 42 *deg.* 20 *min.* to the Lat. 45 *deg.* 50 *min.* to find the difference of Longitude the Ship has made.

Againſt the Lat. 42 *deg.* 20 *min* and under the ſecond *Rhomb* you will find the Longitude to be 19 *deg.* 13 *min.* and againſt the Lat. 45 *deg.* 50 *min.* and under the ſecond *Rhomb* you will find 21 *deg.* 24 *min.* then from 21 *deg.* 24 *min.* ſubſtract 19 *deg.* 13 *min.* the Remainder 2 *deg.* 11 *min.* is the difference of Longitude required.

Of

This Table ſhews the Suns declination every day of the year, for ſeveral years to come.

Example 1. To find the Suns Declination *Auguſt* the 15*th* 1677.

Turn over the Table, till you find the year 1677. which you will find it to be the firſt after Leap-year, then againſt the fifteenth day under the Month of *Auguſt*, you will find the Suns Declination to be 10 *deg.* 35 *min.* North.

Example 2. To find the Suns Declination, *January* 26 1687.

You will find the year 1687, to be the third after Leap year, and againſt the 26 day and under *January*, you will find the Suns declination to be 15 *deg.* 49 *min.* South.

The uſe of the Tables, of the Sun and Stars Right Aſcenſion, is ſhown in pag. 32.

A Table of Amplitudes for these Degrees of Latitudes.

Sun's Decl.	5		10		15		20		22		24		26	
	D.	M.	D.	M.	D.	M.	D.	M.	D.	M.	D.	M.	D.	M.
0	0	00	0	0	0	0	0	0	0	0	0	0	0	0
1	1	00	1	1	1	2	1	4	1	5	1	6	1	7
2	2	00	2	2	2	4	2	8	2	9	2	12	2	13
3	3	00	3	3	3	6	3	12	3	14	4	17	3	20
4	4	1	4	4	4	8	4	16	4	19	4	33	4	27
5	5	1	5	5	5	10	5	20	5	22	5	28	5	34
6	6	1	6	6	6	13	6	23	6	28	6	37	6	41
7	7	1	7	7	7	15	7	27	7	33	7	40	7	47
8	8	1	8	8	8	17	8	31	8	38	8	46	8	54
9	9	2	9	9	9	19	9	35	9	43	9	51	10	01
10	10	2	10	10	10	21	10	39	10	48	10	57	11	08
11	11	3	11	11	11	23	11	43	11	53	12	03	12	15
12	12	3	12	12	12	25	12	47	12	58	13	09	13	23
13	13	3	13	13	13	27	13	51	14	03	14	15	14	30
14	14	3	14	14	14	30	14	55	15	08	15	21	15	37
15	15	3	15	15	15	32	16	00	16	13	16	27	16	44
16	16	4	16	16	16	35	17	04	17	18	17	34	17	52
17	17	4	17	17	17	37	18	08	18	23	18	40	19	00
18	18	4	18	18	18	39	19	12	19	28	19	46	20	08
19	19	4	19	19	19	41	20	16	20	35	20	54	21	12
20	20	5	20	20	20	44	21	20	11	39	21	59	22	22
21	21	5	21	21	21	46	22	24	22	44	23	08	23	30
22	22	5	22	22	22	49	23	29	23	50	24	12	24	38
23	23	5	23	23	23	41	24	34	24	55	25	19	25	46
23,31	23	37	23	54	23	24	25	38	25	29	25	54	26	22

Degrees of Declination.

The Amplitude is the distance of rising or setting of the Sun or Stars from the true East or

A Table of Amplitudes for these Degrees of Latitudes.

Sun's Decl.	28		30		32		34		36		38		40	
Degrees of Declination.	D.	M.	D.	M.	D.	M.	D.	M.	D.	M.	D.	M.	D.	M.
0	0	00	0	00	0	00	0	00	0	00	0	00	0	00
1	1	08	1	09	1	10	1	12	1	14	1	16	1	18
2	2	16	2	10	2	21	2	25	2	19	2	32	2	36
3	3	24	3	28	3	33	3	38	3	44	3	59	3	55
4	4	32	4	37	4	44	4	50	4	58	5	03	4	13
5	5	40	5	46	5	54	6	02	6	11	6	21	6	32
6	6	48	6	56	7	05	7	14	7	25	7	37	7	50
7	8	56	8	06	8	16	8	27	8	40	8	54	9	09
8	9	04	9	15	9	27	9	39	9	54	10	10	10	28
9	10	12	10	24	10	39	10	52	11	00	12	27	11	47
10	11	21	11	34	11	48	12	05	12	24	12	43	13	06
11	12	29	12	44	13	08	13	18	13	39	14	00	14	25
12	13	37	13	53	14	11	14	32	14	54	15	18	15	44
13	14	45	15	2	15	23	15	4	16	09	16	35	17	04
14	15	54	16	12	16	35	16	59	17	24	17	52	18	24
15	17	03	17	46	17	46	18	12	18	40	19	10	19	45
16	18	12	18	32	18	58	19	26	19	45	20	23	21	05
17	19	21	19	43	20	10	20	39	21	11	21	47	22	26
18	20	31	20	54	21	22	21	53	22	27	23	05	23	47
19	21	39	22	05	23	25	23	07	23	44	24	24	25	09
20	22	48	23	16	23	47	24	22	25	00	25	43	26	31
21	23	57	24	26	25	00	25	37	20	17	27	03	27	53
22	25	06	25	38	26	13	26	52	27	35	28	23	29	16
23	26	15	26	4	27	26	28	07	28	53	29	44	30	40
23,31	26	52	27	25	28	03	28	45	29	32	30	25	31	22

or West Points upon the Horizon.

As in the Table, in the Latitude of 90 *degr.* the

A Table of Amplitude for these Degrees of Latitudes.

Sun's Decl.	42		44		45		46		47		48		49	
Degrees of Declination.	D.	M.	D.	M.	D.	M.	D.	M	D.	M.	D.	M.	D.	M.
0	0	00	0	00	0	00	0	00	0	00	0	00	0	00
1	1	21	1	21	1	25	1	26	1	28	1	29	1	31
2	2	41	2	41	2	50	2	53	2	56	2	59	3	03
3	4	02	4	02	4	15	4	16	4	24	4	29	4	34
4	5	23	5	28	5	40	5	46	5	52	5	59	6	06
5	6	49	6	58	7	05	7	12	7	21	7	29	7	38
6	8	05	8	21	8	30	8	38	8	49	8	59	9	10
7	9	26	9	45	9	56	10	06	10	18	10	30	10	42
8	10	47	11	09	11	21	11	33	12	47	12	00	12	14
9	12	09	12	34	12	47	13	01	13	16	13	31	13	48
10	13	31	23	58	14	13	14	27	14	45	15	02	15	21
11	14	53	15	23	15	39	15	55	16	15	16	34	16	54
12	16	16	16	48	17	06	17	25	17	45	18	06	18	28
13	17	38	18	13	18	33	18	54	19	16	19	39	20	03
14	19	00	19	39	20	00	20	23	20	47	21	12	21	38
15	20	23	21	05	21	28	21	53	22	18	22	45	23	14
16	21	46	22	32	22	56	23	23	23	50	24	20	24	51
17	23	10	23	59	24	25	24	53	25	23	25	55	26	28
18	24	34	25	26	25	55	26	25	26	57	27	31	28	06
19	25	56	26	54	27	25	27	57	28	32	29	07	29	45
20	27	24	28	23	28	56	29	30	30	07	30	45	31	25
21	28	50	29	53	30	27	31	03	31	42	32	23	33	06
22	30	13	31	23	32	00	32	37	33	19	34	03	34	48
23	31	46	32	55	33	32	34	13	34	57	35	43	36	34
23,31	32	27	33	41	34	20	35	02	35	48	36	34	36	26

the Sun or Star having 15 *degr.* North Declination, they will rise 31 *deg.* 10 *min.* to the Northward

A Table of Amplitude for these Degrees of Latitudes.

Degrees of Declination.	Sun's Decl.	50		51		52		53		54		55		56	
		D.	M.	D.	M.	D.	M.	D.	M	D,	M,	D.	M.	D,	M.
	0	0	00	0	00	0	00	0	00	0	00	0	00	0	00
	1	1	33	1	35	1	37	1	39	1	42	1	42	1	47
	2	3	06	3	10	3	15	3	20	3	24	3	29	3	34
	3	4	40	4	46	4	52	4	59	5	06	5	14	5	22
	4	6	14	6	22	6	30	6	38	6	49	6	59	7	10
	5	7	48	7	58	8	08	8	19	8	30	8	45	8	50
	6	9	22	9	34	9	46	10	00	10	15	10	30	10	47
	7	10	56	11	40	11	25	11	41	11	58	12	16	12	35
	8	12	31	12	47	13	04	13	22	13	41	14	02	14	24
	9	14	05	14	24	14	43	15	04	15	26	16	48	16	15
	10	15	40	16	01	16	23	16	46	17	11	17	37	18	06
	11	17	16	17	39	18	03	18	29	18	57	19	20	19	57
	12	18	52	19	18	19	44	20	13	20	43	21	15	21	50
	13	20	29	20	58	21	26	21	57	22	30	23	05	23	43
	14	22	06	22	38	23	08	23	42	24	18	24	57	25	38
	15	23	44	24	17	24	51	25	28	26	07	26	49	27	34
	16	25	23	25	59	26	36	27	16	27	58	28	43	29	32
	17	27	03	27	41	28	21	29	04	29	50	30	39	31	31
	18	28	44	29	25	30	08	30	54	31	44	32	36	33	33
	19	30	26	31	09	31	56	32	45	33	38	34	35	35	36
	20	32	09	32	55	33	46	34	39	35	35	36	36	37	42
	21	33	53	34	48	35	36	36	33	37	33	38	40	39	51
	22	35	40	36	32	37	29	38	31	39	37	40	46	42	04
	23	37	26	38	23	39	24	40	29	41	40	42	56	44	20
	23,31	38	20	39	20	40	21	41	29	43	43	44	02	45	30

ward of the East, and set 31 *degr.* 10 *min.* to the Northward of the West: But if the Declination

A Table of Amplitudes for theſe Degrees of Latitudes.

Degrees of Declination. Sun's Decl.	57		58		59		60	
	D.	M.	D.	M.	D.	M.	D.	M.
0	0	00	0	00	0	00	0	00
1	1	50	1	35	1	56	2	00
2	3	40	3	46	3	53	4	00
3	5	31	5	40	5	50	6	00
4	7	22	7	34	7	47	8	01
5	9	14	9	28	9	45	10	02
6	11	04	11	23	11	43	12	04
7	12	56	13	18	13	41	14	06
8	14	48	15	14	15	41	16	10
9	16	42	17	10	17	41	18	14
10	18	36	19	08	19	42	20	19
11	20	31	21	06	21	45	22	26
12	22	26	23	06	23	49	24	34
13	24	23	25	07	25	59	26	44
14	26	22	27	10	28	01	28	56
15	28	22	29	14	30	10	31	10
15	30	24	31	21	32	22	33	27
17	32	28	33	29	34	35	35	47
18	34	34	35	40	36	52	38	10
19	36	43	37	54	39	13	40	37
20	38	53	40	12	41	37	43	10
21	41	09	42	34	44	40	45	47
22	43	27	44	59	46	40	48	32
23	45	50	47	30	49	21	51	24
23,31	47	02	48	49	40	44	52	53

clination had been 15 *degr.* South, then they would have riſen 31 *degr.* 10 *min.* to the Southward of the Eaſt, and ſet 31 *degr.* 10 *min.* to the Southward of the Weſt.

Look for your Latitude in the head of the Table, and the Declination in the firſt Column on the left hand, and in the Common Angle of meeting you will find the Amplitude deſired.

In the Latitude of 30 *degr.* the Suns Declination being 7 *degr.* 00 *min.* North, I demand the Amplitude.

Anſwer. The Amplitude is 8 *degr.* 6 *min.* from the

the East Northward, at Sun-rising, or from the West Northward at Sun-setting: But if the Declination had been 7 *deg.* 00 *min.* South in Latitude. 30 *deg.* as aboveſaid, then the Amplitude would have been 8 *deg.* 6 *min.* from the East Southward at Sun-riſing, and 8 *deg.* 6 *min.* from the Weſt Southward at Sun-ſetting; for if the Declination be North, the true Amplitude will always be to the Northwards of the Eaſt or Weſt: But if the Declination be South, the true Amplitude will always be to the Southwards of the Eaſt or Weſt

If you have any odd *min.* of Declination, you muſt take the proportional part.

In the Latitude of 42 *deg.* 30 *min.* the Suns Declination being 12 *deg.* 15 *min.* I demand the Amplitude.

Anſwer, The Amplitude is 16 *deg.* 43 *min.*

ADVERTISEMENT.

IN Marſh-Yard, *a little below the* Hermitage-Stairs *in* Wappin, *are taught theſe Mathematical Sciences*, viz. Arithmetick, Geometry, Algebra, Trigonometry, Navigation, Gunnery, Aſtronomy, Surveying, Gauging, Dialling, *the Uſe of the* Globes *and other* Mathematical Inſtruments, Projection of the Sphere, *and other parts of the* Mathematicks,

7 MA 68

By *John Colſon.*

To know the Hour and Minute of the Sun-rising and setting at any time of the Year, in any place of the habitable World.

By *HENRY PHILIPS.*

THe time of the Sun-rising and Setting is exactly set down in the fifth Column of the *Sea mans Kalender*, for every day of the Year for the Latitude of *London*, so that by knowing the Day of the Month, you may know the time of Sun-rising and Setting without further trouble. Now if you double the time of Sun-rising, you may know the length of the Night; Likewise double the time of the Sun-setting, and it shews the length of the Day. This is so plain, that it needs no example:

But because the Sun-rising and Setting doth differ in every Latitude; Therefore for the use of Sea-men I have set down this Table, by the which knowing the Place of the Sun, and the Latitude of the Place you are in, you may know the time of Sun-rising and Setting in any place of the habitable World.

Because the Day of the Month is more readily

Here enter with the day of the Month to find the Sun's setting.

A Table of the Sun's rising and setting in all Places to the Latitude of 60 Degrees.

The Latitude or Height of the Pole.

			5		10		15		20		25		30		35		40	
			h.	m.	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.
December	11	11	5	51	5	42	5	33	5	24	5	13	5	2	4	49	4	34
	17	05	5	51	5	42	5	33	5	24	5	13	5	3	4	50	4	35
	23	29	5	52	5	43	5	33	5	25	5	14	5	4	4	51	4	36
	28	23	5	52	5	43	5	34	5	25	5	16	6	6	4	53	4	40
	03	17	5	53	5	44	5	35	5	27	5	18	5	8	4	56	4	44
January	09	11	5	53	5	45	5	37	5	29	5	21	5	11	5	0	4	48
	15	06	5	54	5	46	5	39	5	31	5	23	5	15	5	4	4	54
	21	31	5	54	5	48	5	41	5	33	5	26	5	19	5	10	5	8
	27	25	5	55	5	49	5	43	5	36	5	30	5	23	5	15	5	6
	02	19	5	56	5	50	5	45	5	39	5	34	5	28	5	21	5	13
February	08	13	5	56	5	52	5	47	5	43	5	38	5	33	5	28	5	21
	14	07	5	57	5	53	5	49	5	45	5	42	5	38	5	34	5	28
	20	31	5	58	5	55	5	51	5	49	5	47	5	44	5	41	5	36
	26	25	5	58	5	57	5	55	5	52	5	51	5	49	5	47	5	44
	04	18	5	59	5	58	5	57	5	56	5	55	5	54	5	53	5	52
March	10	12	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0
	16	06	6	1	6	2	6	3	6	4	6	5	6	6	6	7	6	8
	22	31	6	2	6	3	6	5	6	7	6	9	6	11	6	13	6	16
	28	25	6	2	6	5	6	8	6	11	6	13	6	16	6	19	6	24
	03	19	6	3	6	7	6	11	6	15	6	18	6	22	6	26	6	32
April	09	13	6	4	6	8	6	13	6	17	6	22	6	27	6	32	6	39
	15	06	6	4	6	10	6	15	6	21	6	26	6	31	6	39	6	47
	22	31	6	5	6	11	6	17	6	24	6	30	6	37	6	45	6	54
	28	25	6	6	6	12	6	19	6	27	6	34	6	41	6	50	7	0
May	05	19	6	6	6	14	6	21	6	29	6	37	6	45	6	56	7	6
	10	12	6	7	6	15	6	23	6	31	6	39	6	49	7	0	7	12
	17	06	6	7	6	16	6	25	6	33	6	42	6	52	7	4	7	17
	23	30	6	8	6	17	6	26	6	35	6	44	6	54	7	7	7	21
June	29	23	6	8	6	17	6	27	6	35	6	46	6	56	7	9	7	24
	04	17	6	9	6	18	6	27	6	36	6	47	6	57	7	10	7	25
	11	11	6	9	6	18	6	27	6	36	6	47	6	58	7	11	7	26
Sun's rising.			5		10		15		20		25		30		35		40	

In South Latitude

A Table of the Sun's rising and setting in all Places to the Latitude of 60 Degrees.

The Latitude or Height of the Pole.

44		47		50		52		54		56		58		60	
h.	m.	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.
4	21	4	09	3	55	3	45	3	33	3	20	3	04	2	44
4	21	4	10	3	56	3	46	3	34	3	21	3	05	2	46
4	23	4	12	3	59	3	49	3	37	3	24	3	09	2	51
4	27	4	16	4	03	3	53	3	43	3	30	3	16	2	59
4	31	4	21	3	09	4	00	3	50	3	38	4	25	3	09
4	37	4	27	4	16	4	08	3	58	3	48	3	36	3	22
4	43	4	34	4	24	4	19	4	08	3	59	3	48	3	35
4	50	4	42	3	33	4	26	4	19	4	11	4	01	3	50
4	58	4	54	4	43	4	37	4	30	4	23	4	15	4	05
5	06	5	00	4	53	4	48	4	43	4	36	4	25	4	21
5	15	5	10	5	04	5	00	4	55	4	50	4	44	4	37
5	41	5	19	5	15	5	11	5	08	5	04	4	59	4	54
5	33	5	29	5	26	5	23	5	21	5	18	5	14	5	16
5	42	5	40	5	37	5	36	5	34	5	33	5	29	5	27
5	51	5	50	5	49	5	48	5	47	5	46	5	49	5	43
6	04	6	00	6	00	6	00	6	00	6	00	6	00	6	00
6	09	6	10	6	11	6	12	6	13	6	14	6	15	6	17
6	83	6	20	6	23	6	24	6	26	6	28	6	31	6	33
6	27	6	34	6	37	6	37	6	39	6	42	6	46	6	50
6	36	6	41	6	42	6	49	6	52	6	56	7	01	7	06
6	45	6	50	6	56	7	00	7	05	7	10	7	16	7	23
6	54	7	00	7	07	7	12	7	17	7	24	7	31	7	39
7	10	7	09	7	17	7	23	7	30	7	37	7	45	7	55
7	20	7	14	7	27	7	34	7	41	7	49	7	59	8	10
7	19	7	26	7	36	7	41	7	52	8	00	8	12	8	25
7	23	7	33	7	41	7	52	8	02	8	12	8	24	8	38
7	29	7	39	7	51	8	00	8	10	8	22	8	35	8	51
7	33	7	44	7	57	8	07	8	17	8	30	8	44	9	01
7	37	7	48	8	01	8	11	8	23	8	36	8	51	9	09
7	39	7	50	8	04	8	14	8	26	8	39	8	55	9	14
7	39	7	51	8	05	8	15	8	27	8	40	8	56	9	16
44		47		50		52		54		56		58		60	

In South Latitude.

Here enter with the day of the Month to find the Sun's rising.

July	11	11
	05	17
	29	23
May	23	30
	17	06
	10	12
June	04	19
	28	25
	23	31
April	15	06
	09	13
May	03	19
	28	25
March	22	31
	16	06
September	09	13
	04	18
October	26	25
	20	30
February	14	27
	08	13
August	02	19
	27	25
November	21	31
	15	06
January	09	11
	03	17
December	28	23
	23	29
	17	05
	11	11

Sun's setting.

known to some, than the Sine which the Sun is in; Therefore I have on the sides of the Table, set down the Days of the Months, the use whereof is the same with the other. For if you find the Day of the Month on the Table, and the Latitude you are in at the head of the Table, in the square meeting of these two, you shall find the Sun-rising or Setting, as before.

For Example.

The 21 of *January* in the Latit. of 40 *deg.* the Sun sets at 5 *h.* 0 *m.* the difference of time is 6. *m.* and the difference of the Days are 6, that is 1 *min.* for every Day. So that if you would know the time of Sun-set on the 24 Day, it will be 5 *h.* 3 *m.*

Again, if you would know the time of Sun-set on the 24 of *Jan.* in the Latitude of 42 *deg.* Here is neither the Day of the Month, nor the Latitude to be found exactly; But you find that the 21 of *Jan.* in the Latitude of 40 the Sun sets at 5 *h.* 0 *m.* And the 27 of *Jan.* in the Latitude of 44, the Sun sets at 4 *h.* 58 *min.* Now because the Latitude of 42 is the middle between 40 and 44, and likewise the 24 Day, the middst between the 21 and 27 Dayes; Take the middle time between the two times set down in the Table, which is 9 *h.* 56 *m.* which is the time of Sun-set on that Day; in the Latitude desired.

FINIS.

T. M. 68

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Henry Bond.

FINIS.